THE EFFECTS OF NON-SEMESTERED AND SEMESTERED PHYSICAL EDUCATION PROGRAMS ON THE PHYSICAL ACTIVITY LEVELS AND EXPERIENCES OF GRADE NINE STUDENTS

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Saskatoon, Saskatchewan, Canada

By

Josiah D. Boyd

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ABSTRACT

School physical education (PE) programs are often viewed as one of the best and most effective ways to encourage children and youth to be physically active as they provide an environment ideal for the promotion of a healthy lifestyle. Due to the potentially powerful role that PE can play in the health of youth, attention needs to be given to ensure that these programs are as effective as possible. In Canada, recommendations have been made for daily physical education for students from kindergarten through grade 12 yet most high schools are not meeting this goal. At the high school level, physical education is frequently provided for students through one of two scheduling systems: (a) *semestered* physical education (PE class every day for half of the school year), and (b) *non-semestered* physical education (PE class every second day for the entire school year). To date, no research exists that investigates the influence of the scheduling of PE on the physical activity levels, participation rates, and experiences of high school students. Using a mixed methods research design, the purpose of this study was to investigate the effect that the scheduling of PE programs has on the subsequent physical activity levels and experiences of the students involved. This study was conducted in two phases. In phase one, Grade 9 students enrolled in two schools (n = 245), with one school offering semestered PE and one school offering non-semestered PE, completed an activity recall questionnaire. This questionnaire was administered three times (October, February, and May) throughout the school year. At the baseline data collection in October, the students in the two schools had comparable total physical activity levels. The most notable difference could be seen in May where students enrolled in non-semestered PE had significantly higher physical activity levels than baseline ($p>.05$) while students enrolled in the semestered PE program showed a trend of decreasing physical activity levels. It was also found that students enrolled in the non-semestered PE program showed significantly higher levels of

participation in structured physical activity ($p>.05$), activities that had to be signed up or registered for, at school and away from the school. In the second phase of the study, students were organized into focus groups based on their gender and activity level. The focus group discussions explored the experiences of students in both types of PE programs. Common themes from the focus groups included the role that non-semestered PE played in the promotion of physical activity throughout the year. It was found that the non-semestered schedule fostered a continued interest in PE but that it interfered with the scheduling of other academic classes. Semestered PE appealed to those students who preferred to get PE over with and/or appreciated the familiar routine of the one-term class. Key decision-makers were also interviewed with many of the same themes emanating. Non-semestered physical education was seen as advantageous for encouraging physical activity levels in students, but being logistically difficult to schedule. Students and key decision-makers agreed that while semestered PE was more convenient for administration, non-semestered PE would encourage PA levels, enrollment in elective PE, and participation in intramural activities and school sports teams. In conclusion, this study provides support for the investigation into the effects of PE scheduling on the physical activity levels of students. The non-semestered PE program appeared to encourage students to be more involved in structured physical activities and was supported by most students and key decision-makers with the chief objection being the logistical inconveniences. However, with youth inactivity still a major problem in Canada, and changes being desperately needed, mere inconveniences should not discourage the implementation of possible physical activity-improving initiatives like non-semestered physical education.

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DEDICATION

I would like to dedicate this thesis to my family. To my mom and dad for showing me what it means to be a true student for life, for always encouraging me to look forward without trivializing the present, and for being a constant source of affirmation and support. And, to my brothers, for showing me the meaning of hard work and dedication and for waiting for me.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

The many health benefits of regular physical activity are well documented within the research literature for both adults and children. It has been shown that regular physical activity and higher levels of fitness allow adults to accomplish common daily tasks with greater ease and comfort and with less fatigue (Public Health Agency of Canada, 2006). In addition, active adults reduce the risk of developing many of the chronic diseases that are becoming prevalent in North America today (Heart & Stroke Foundation, 2006; Epstein et al., 1985; Centers for Disease Control (CDC), 1996). In spite of the reported benefits of physical activity, 77% of women and 74% of men in Canada are inactive (Bruce & Katzmarzyk, 2002). It has been reported that a significant correlate of physical activity levels in adults are early physical activity experiences as children and youth (Thompson et al., 2001).

It has been reported that regular physical activity is an essential component for the healthy growth and development of children and youth (Public Health Agency of Canada, 2006). Regular physical activity has also been shown to have numerous physiological, psycho-social, and cognitive benefits (Magarey, Daniels, Boulton & Cockington, 2003; Daley & Ryan, 2000; Tremblay, Inmann & Willms, 2000; Shephard, 1997). In spite of the many known benefits associated with physical activity, less than half of Canadian children and youth are active enough to receive the optimal benefits (CFLRI, 2004; Craig & Cameron, 2004). As levels of inactivity in young Canadians

continue to rise, the prevalence of a number of related health concerns is also growing (Cone, 2004; Tremblay, Katzmarzyk & Willms, 2002; USDHHS, 2001). The risks associated with inactive living have become so prominent that, in an effort to emphasize the magnitude of the problem, inactivity has been identified as a disease termed Sedentary Death Syndrome (SeDS) (Lees & Booth, 2004). The levels of physical inactivity in Canadian people, including children and adolescents, has prompted many health organizations to develop age-sensitive recommendations for physical activity levels (Active Healthy Kids Canada, 2006; Public Health Agency of Canada, 2006; Health Canada, 2004; Health Canada, 2002).

In addition to being a health concern, inactivity also results in an economic burden. The World Health Organization (2004) estimated that diseases related to physical inactivity were responsible for 59% of deaths worldwide and just under half of the global health burden. Similarly, Katzmarzyk (2000) determined that over $3 billion of the cost of Canada's healthcare system in 1999 was attributable to sedentary living.

Though addressing the issue of inactivity is important at all ages, the period of adolescence is of particular concern as a sharp decline in exercise levels and motivation to adhere to regular physical activity seems to exist at this stage of life (Baranowski et al., 2000b, Centers for Disease Control and Prevention, 1996). Also, it has been suggested that the experiences in childhood and adolescence affect lifelong health (Thompson, Humbert & Mirwald, 2003), and the earlier the problem of the sedentary lifestyles of the younger generations is addressed, the greater the return will be (Health Council of Canada, 2006).

While there are many factors that contribute to current physical activity levels in children and youth (Spink et al., 2005), it has been suggested that the setting that has the most promise for having a significant health influence are schools (Mendelson, 2007; Sallis & McKenzie, 1991). School physical education programs are often viewed as one of the best and most available ways to

encourage children and youth to be physically active as they provide an environment ideal for encouraging adolescents to take steps toward healthier lifestyles and facilitating those changes (CAHPERD, 2006; Mandigo, 2004; Wallhead & Buckworth, 2004; Cone, 2004). Quality physical education programs can encourage more physically active lifestyles within, and away from, the school environment (Mandigo, 2004) and are promising for their potential scope and impact as almost all young people 6-16 attend school (CDC, 1996).

In 1996, the Surgeon General called for quality daily physical education for students from Kindergarten to grade 12 (CDC, 1996). However, despite the call for *daily* physical education, only 57% of Canadian students, elementary and high school combined, have physical education class every day (Hardman & Marshall, 2000) and, in high school, physical education typically lasts only half of the school year. In the United States, only 27% of high school students (grades 9-12) were enrolled in daily physical education. Despite the Surgeon General's recommendations, seven years later, only 39% of Canadian schools report having physical education taught by specialists (Cameron, Craig, Coles & Cragg, 2003), bringing the *quality* aspect of the Surgeon General's recommendation into question (CFLRI, 2001).

In Saskatchewan, physical education is provided for high school students through one of two scheduling systems: (a) semestered physical education, and (b) non-semestered physical education. Semestered physical education consists of students attending physical education class every school day for the length of one 5-month semester. Non-semestered physical education consists of students attending physical education class on alternate days for the entire 10-month school year. To date, it is not known whether one type schedule (semestered of non-semestered) is more successful at promoting and encouraging physical activity in students.

1.2 Review of Literature

1.2.1 The Benefits of a Physically Active Lifestyle for Children and Youth

Physical activity is essential for the healthy growth and development of children and youth (Public Health Agency of Canada, 2006). Numerous researchers have determined that regular exercise has many physiological, psychosocial, and cognitive benefits (Magarey et al., 2003; Daley & Ryan, 2000; Trembley et al., 2000; Shephard, 1997).

Physiologically, regular physical activity in childhood develops cardiovascular fitness, strength, flexibility and bone density (Khan et al., 2000). Physical activity in childhood and adolescence helps reduce a number of risk factors for diseases such as coronary heart disease and diabetes later in life (Public Health Agency of Canada, 2006). Janz (2002) found that osteoporosis originates in early life and bone mass development in childhood and adolescence influences the risk for bone fractures. It has been reported that 35-40% of a person's total bone mass is laid down within the four years of adolescence (Bailey, 1997). In addition to the stress-reducing benefits of exercise leading to an improved immune system functioning (Sothern et al., 1999), it has been suggested that regular physical activity stimulates immune cell growth and assists in destroying tumor cells, viral-infected cells, and eliminates injured tissue (Heberman & Holden, 1979).

Looking at the psycho-social and cognitive benefits, Health Canada (2002) suggested that, for children and adolescents, regular physical activity can provide a platform for meeting new friends and improving physical self-esteem (Health Canada, 2002), two components that are vital to youth during adolescence. Tremblay and colleagues (2000) determined that adolescents who participate in regular physical activity demonstrate lower levels of anxiety and depression. These findings may be linked to research that determined that regular physical activity helps maintain a healthy body weight (Tremblay & Willms, 2000), which is consistently related to improved levels

of self-esteem and body image (Public Health Agency of Canada, 2006; Tremblay, et al., 2000; Kirkcaldy, Shephard & Siefen, 2002). In addition to these findings, physically active young people are less likely to use tobacco, alcohol, or other drugs, and males have been shown to be more sexually responsible when compared to less active youth (Pate, Trost, Levin & Dowda, 2000). A daily routine including physical activity has been attributed with reducing tension and hostility, improving energy and concentration levels, and enhancing mental performance and mood (Health Canada, 2002; CDC, 1996; King, Taylor, Haskell & DeBusk, 1989). Finally, problems of juvenile delinquency have been shown to decrease when appropriate physical activity programs are available (Public Health Agency of Canada, 2006).

Focusing on the benefits of activity in an academic setting, regular physical activity has been shown to possibly enhance academic performance in students (Public Health Agency of Canada, 2006; Dwyer, Sallis, Blizzard, Lazarus & Dean, 2001; Daley & Ryan, 2000). Shephard (1997) found that higher physical activity levels in students might decrease study time without decreasing academic performance, as the learning appears to happen more rapidly.

1.2.2 The Risks Associated with Inactivity for Children and Youth

Physical inactivity and the related health problems have become such a concern in North America that inactivity has reached disease status and has been termed Sedentary Death Syndrome (SeDS) (Lees & Booth, 2004). The identification of inactivity as a disease emphasizes the seriousness of sedentary living, putting SeDS in the same category as current health concerns such as new flu strains, Severe Acute Respiratory Syndrome (SARS), and West Nile Virus (Lees & Booth, 2004). There are over 25 chronic diseases contributing to the increasing number of premature deaths in our culture, many of which have been linked to physical inactivity (Lees & Booth, 2004). Research has shown that the origins of many of the prevalent health problems in

North America today, specifically those linked to obesity, hypertension, and inactivity, can be traced back to childhood (McMurray et al., 2002; Kelder et al., 1995). Thus, the promotion of physical activity in children and youth is deemed to be a high priority (Healthy Active Kids Canada, 2007). Despite growing public awareness of the risks of inactive lifestyles and the ailments that can follow, this trend of sedentary living shows no signs of subsiding and the prevalence of inactivity and obesity are rapidly increasing (Weisberg, 2002).

The collection of chronic diseases associated with physical inactivity combine for an estimated 59% of deaths worldwide each year and just under half of the global disease burden (WHO, 2004) making the trend towards sedentary living not only a health problem, but an economic concern as well. In 2000, Katzmarzyk estimated that as much as $3.1 billion of the total cost to the Canadian healthcare system was attributable to physical inactivity and suggested that a 10% reduction in the prevalence of the sedentary trend may reduce these expenditures by $150 million per year. As these trends of physical inactivity continue to rise, it is expected that the burden placed on our health care system will increase accordingly (Mandigo, 2004). According to Cone (2004), to ignore these health issues and trends will lead a continuing rise in the costs of medical care and a decline in life expectancy and quality of life.

1.2.3 The Importance of Addressing the Physical Activity Levels of Youth

As children age they become less active and there is a significant decline in participation in physical activity once children reach secondary school (Active Healthy Kids Canada, 2006; Biddle, Bower & Stensel, 2004). As youth move into the adolescent stage of life, motivation to adhere to regular physical activity declines (Baranowski et al., 2000b) making the early teenage years a critical time for intervention.

Many of the risks associated with an inactive lifestyle for youth are similar to those for adults (Telama, Yang, Laakso & Viikari, 1997) and a significant factor effecting physical activity levels in adults is early physical activity experiences as youth (Thompson et al., 2001). For example, obesity in childhood is related to obesity in adulthood and, in turn, overweight and obesity in children is linked to morbidity and mortality in adults (Ferraro, Thorpe & Wilkinson, 2003). It has also been found that the origins of many prevalent health problems in North America today, specifically those linked to obesity, hypertension, and inactivity, can be traced back to childhood (McMurray et al., 2002; Kelder, Perry, Peters, Lytle & Klepp, 1995). With these facts in mind, the promotion of physical activity in youth is deemed to be a high priority. Educating children and adolescents about the importance of exercise and nutrition, and providing them with opportunities to be physically active, can encourage the development of good habits that will follow them throughout their lives and possibly alleviate some health concerns currently associated with the trend of sedentary living (Sallis et al., 1997).

1.2.4 Current Recommendations for Physical Activity for Children and Youth

The decline in the health of Canadians is associated with increasing levels of physical inactivity. This situation has prompted numerous agencies to publish recommendations related to the amount of physical activity needed to enhance health and wellbeing. The Surgeon General emphasized that regular participation in moderate to vigorous physical activity is an essential component of a healthy lifestyle (Lee & Solmon, 2005; USDHHS, 1996). Health Canada (2004) called for Canadians of all ages to increase their physical activity levels. Health Canada's (2002) Physical Activity Guide for Children and the Physical Activity Guide for Youth recommend that children and youth:

1 Include a minimum of 60 minutes with the goal of reaching 90 minutes of moderate physical activity every day.

2 Implement a combination of three types of physical activity – endurance, flexibility, and strength.

3 Gradually build up physical activity levels if not currently active to better ensure the longevity of compliance to regular activity. Health Canada (2002) suggests a 5 month gradient for increasing physical activity levels and decreasing "non active" time.

4 Build up physical activity throughout the day in periods of at least 5 to 10 minutes.

1.2.5 Canadian Children and Youth: How active are they?

As previously mentioned, the existing literature has revealed that a large number of children and youth are not meeting the recommendations outlined above and, thus, they are not experiencing the full benefits of a physically active lifestyle (CFLRI, 2004; Craig & Cameron, 2004). More specifically, less than half of Canadian youth participate in a level of daily physical activity that meets the recommendations for healthy growth and development (Active Healthy Kids Canada, 2006; Strong et al., 2005). Age seems to play a role as it has been reported that, with respect to both structured and unstructured physical activity, there is a significant decline in participation once children reach adolescence (Active Healthy Kids Canada, 2006; Centers for Disease Control and Prevention, 1999).

A recent study conducted in Saskatchewan determined that 73% of youth, aged 5 to 17, are not meeting the recommended guidelines for the optimal health benefits that physical activity offers (Saskatchewan in motion, 2005). For these children and youth, there are many factors that contribute to the falling levels of physical activity. For example, it has been reported that less than 20% of Canadian children are meeting the Canadian Medical Association's recommended 2 hours

or less of daily television, and about a third are spending more than 2 hours a day in leisure computer use (Active Healthy Kids Canada, 2006). Research has also shown that the physical activity levels of children and youth often reflect the physical activity levels of their parents (In motion, 2006).

1.2.6 The Potential Role of the School and Physical Education Programs

While there are many factors that contribute to physical activity levels in children and youth, it has been suggested that the setting that has the most promise for playing a significant role in enhancing physical activity in children and youth are schools (Mendelson, 2007; Sallis & McKenzie, 1991). By the time they reach the age of six, most children are spending 25-30 hours each week at school, extending through the next 12 years of their lives. Thus, school-based programs as a vehicle for health promotion are promising, not only for their potential scope – almost all young people from 6-16 attend school – but also for their potential impact (CDC, 1996). Both Wallhead & Buckworth (2004) and Story (1999) identified schools as being an important method of transferring information and a potentially potent tool in the fight against Sedentary Death Syndrome by educating, empowering, motivating, and facilitating good habits among youth with the hope that they will filter on throughout their lives and into adulthood.

In most countries around the world, the response of schools to this growing societal need for physical activity is reflected chiefly through physical education programs (Fox, Cooper & McKenna, 2004; Hardman, 2000). Mandigo (2004) emphasized the powerful influence of the school on young people and suggested that physical education programs provide the first line of defense against the growing sedentary trend. Corbin (2002) suggested that school physical education programs are capable of making a considerable contribution in the promotion of lifelong physical activity.

1.2.7 The Role of Key Decision-makers

The responsibility of increasing the physical activity levels of youth and adolescents falls on many shoulders and, for physical education programs to be maximally effective, administrators and school boards need to be supportive (Thissen-Milder, 2006). Three components have been identified as essential in the creation of an effective physical education program. These include the physical education staff, the program organization and administration, and the policies and procedures guiding the program (Thissen-Milder, 2006).

Physical education teachers can have a significant impact on students as they are often seen as role models of physically active and healthy behaviors (Cameron et al., 2003; Cardinal & Cardinal, 2001; Stelzer, 2005; La Vine & Ray, 2006). The attitudes and actions of physical education teachers have been shown to positively affect the duration and quality of high school physical education classes (CDC, 2000). However, while their potential influence is great, physical education teachers are often not receiving sufficient opportunity to exert their influence as over half of all Canadian secondary schools do not have a policy in place to provide daily physical education classes to students (Cameron et al., 2003). Of the elementary and secondary schools that report having a policy for daily physical education, only 16% report that they provide physical education classes daily (Cameron et al., 2003) meaning that policies are not always being carried out.

Physical education teachers, high school administrators, and physical education consultants all play a large role in the effectiveness of physical education programs and are involved in the creation and adherence to the policies that run the school. As such, it is important to better understand the key decision-makers' perceptions and experiences with current physical education programs, as they are all a large piece of the puzzle with which the research questions of this study are focused.

1.2.8 The Current State of Canadian Physical Education Programs

In Canada, it is currently recommended that physical education be taught by a qualified health educator or physical education specialist, for 150 minutes a week, for students in kindergarten through grade 12 (Canadian Association for Health, Physical Education, Recreation and Dance (CAHPERD), 2006). Despite this recommendation, only 57% of all Canadian high schools and elementary schools meet this standard (Hardman & Marshall, 2000). Craig, Cameron, Storm, Russell and Beaulieu (2001) found that 20% of parents of high school students in Canada reported that their child received no physical education at all.

While the frequency of physical education classes is an issue in the elementary years, enrollment becomes an issue in high school. A significant decline in enrolment occurs once physical education becomes an optional subject in the upper years of high school (Craig & Cameron, 2004). As previously mentioned, Canadian physical activity advocates and researchers have recommended quality daily physical education as an important vehicle for enhancing and increasing the physical activity experience of children (Cone, 2004) and this objective can not be met if youth are not participating in physical education classes.

The quality of physical education programs in Canada is also a concern as only 39% of Canadian schools reported that those teaching physical education are specialists (Cameron et al., 2003). A physical education specialist is a teacher with the appropriate qualifications and training in physical education (CFLRI, 2001). Despite the amount of research evidence supporting quality daily physical education programs, Mandigo (2004) suggested that Canada is not meeting the fundamental rights that children and youth have to access quality physical education taught by trained professionals.

As mentioned earlier, the goals for physical education programs should be to educate, motivate, facilitate, and empower youth and adolescents to take strides toward bettering their

personal health situations (CAHPERD, 2006). Within every provincial physical education curriculum in Canada are general outcome statements devoted to supporting children and youth in the development of the necessary attitudes, skill, and knowledge enabling them to lead a healthy and active lifestyle (Mandigo, 2004). The goal of physical education in Saskatchewan is to provide skills and attitudes to make active living a way of life in which physical activity is valued in daily life (SPEA, 2006). This goal of Saskatchewan physical education would be more easily accomplished if CAHPERD's (2006) recommendations for 150 minutes of quality daily physical education per week were being met (Strong et al., 2005). This amount of time in physical education would allow physical education teachers more opportunities to instill some of the necessary skills and attitudes to help make active lifestyles more valued by students (Fraser-Thomas & Beaudoin, 2002; Story, 1999).

With physical education recommendations currently not being met, all possibilities for improvements to physical education programs should be pursued. Improving physical education programs is an important step in addressing current health concerns. The Canadian Association for Health, Physical Education, Recreation and Dance identified several aspects of physical education programs in need of improvement. These include: the curriculum being used, the environment in physical education classes, the facilities and equipment available, and the scheduling of the physical education program (CAHPERD, 2006). With the exception of the scheduling of a physical education program, these aspects are frequently addressed in the research literature. The lack of research that exists addressing the scheduling of physical education and its effects on the physical activity levels of students contributed to the justification for this study.

Currently in Saskatchewan, and most of Canada, high school physical education is scheduled in one of two ways: Semestered and non-semestered. In a semestered physical education program students attend physical education class every school day for the length of one 5-month

term (one semester). In a non-semestered physical education program students attend physical education class on alternate days for the entire 10-month school year (two semesters).

The scheduling of high school classes has been a focus of research in the past decade, as teachers and administrators search for ways to improve both teaching and learning (Bukowski & Stinson, 2000). Traditionally, high schools have programmed six to seven classes daily for 50-55 minutes each. As a way to modify the traditional 6-hour school day for high school students, many schools, especially in the United States, have implemented block scheduling (Zepeda & Mayers, 2006). Block scheduling is based on the concept of having fewer classes (usually four) during each school day, but having each class last anywhere from 80 to 120 minutes (Bryant Jr., & Claxton, 1996). Though there are variations, the general idea of block scheduling stays the same. The *alternating block schedule*, or the *A/B block*, is typical for a non-semestered schedule. Typically, the *A/B block* requires students to take eight classes (four each day), alternating every-other day for the length of the school year. The *4 x 4* is a variation of block scheduling and is typical for a semestered schedule. The *4 x 4* requires students to take eight classes, four in the first semester, and four different classes in the second semester.

Despite the popularity of the topic of school scheduling in the current literature, there are a few major shortcomings in published studies on this topic. First, most of the existing studies do not specify the type of block scheduling (A/B, 4 x 4, etc.) investigated (Bukowski & Stinson, 2000) leaving the reader uncertain as to which schedule to attribute the findings. Second, the majority of research involving block scheduling fails to specify the setting in which they were conducted (Zepeda & Mayers, 2006). Finally, none of the studies focus on the impact of block scheduling on specific subjects such as physical education and it is possible that the effects of different types of schedules may have a more pronounced impact on specific classes.

Though they are similar in some ways, the *A/B block* differs slightly from the non-semestered scheduling, as does the *4 x 4* from the semestered scheduling. In Saskatchewan, the non-semestered program is not part of a blocked schedule, because students take 5-6 classes every day lasting 50-55 minute each. The classes do alternate every-other day, the same as in *A/B block*, but with the inconsistencies of the current literature it is not possible to say, with a level of confidence, that the positive changes that were found in some of the studies came from the alternating days or from the extended class times. Bukowski & Stinson (2000) noticed the inconsistencies of the current research and they suggested the following:

> An analysis of the block scheduling research [in the United States] reveals a rather shallow literature. Because of the paucity of research on block scheduling and the unique characteristics of individual schools, generalizations about the effects of block scheduling are problematic at best. (p. 159)

Though block scheduling has been the topic of much research, the use of semestered and non-semestered schedules in many Canadian schools including those in Saskatchewan, is occurring with little knowledge of the possible effects on student knowledge, attitudes and behaviors. To date, there have been few national or international studies that have investigated the impact that the scheduling of physical education has on the physical activity levels and experiences of students. McKenzie (2001) determined that middle school students' physical activity levels were greater on days that they had physical education classes than on non-physical education days. Dale, Corbin & Dale (2000) reported that grade 3 and 4 students that were involved in physical education classes were more likely to be more active after school. However, no research exists that has determined the effects of the scheduling of physical education on the activity patterns of high school students.

1.3 Specific Aims of this Study

The aim of this study was to investigate the effect of the scheduling of physical education programs on the physical activity levels and experiences of high school students. The two scheduling approaches that were investigated were the semestered and the non-semestered schedules. This study also sought to understand the perceptions and beliefs of high school physical education teachers, administrators, and physical education consultants regarding the role that the scheduling of physical education played in the physical activity levels and the physical education experiences of high school students.

1.4 Hypotheses

It was hypothesized that there would be significant differences in the physical activity levels, and the maintenance of those levels over the school year, in students enrolled in the two different physical education programs being examined. More specifically, it was hypothesized that students enrolled in the non-semestered physical education program would maintain their physical activity throughout the school year and would display higher levels of physical activity in general. It was also hypothesized that higher levels of participation in structured physical activity programs such as intramural activities and interscholastic sport teams would be found in the non-semestered participants. The formulation of hypotheses was not suitable for phase two, the qualitative component, of this study.

1.5 Research Questions

Three research questions provided the framework that guided this study. From these questions, interview guides were developed for the student focus groups, physical education teachers, school administration, as well as the physical education consultants. Not only did these

research questions guide the data collection in the interviews, they were also a source of direction during data analysis.

1. What are the activity levels, in school and out of school, of high school students enrolled in semestered and non-semestered physical education programs over the course of a 10-month school year?
2. What are the experiences of high school students in semestered and non-semestered physical education programs; do students perceive that the scheduling of physical education effects physical activity levels?
3. How do teachers and key decision-makers perceive the role that the scheduling of physical education plays in physical activity levels and experiences of high school students?

CHAPTER 2

METHODS

2.1 General Methodological Approach

To answer the research questions that guided this study an approach that would provide the most holistic insight into the effects of the scheduling of physical education on grade 9 students' physical activity behaviors and experiences was needed. Thus, a mixed methods research strategy was chosen for this study. In this section, a description of the characteristics of mixed methods research will be outlined as well as the rationale used in the selection of this type of research method. The specific type of mixed methods framework chosen for this research will be described, using both theoretical and practical examples and models. Lastly, a description of the procedures followed for both data collection and data analysis will be provided.

2.1.1 Characteristics of Mixed Methods Research

The continued development and perceived legitimacy of both quantitative and qualitative methods of inquiry in the social and human sciences has resulted in an expansion in the area of mixed methods research (Creswell, 2003). The concept of mixing different methods, employing the data collection associated with both forms of data, is thought to have originated when Campbell and Fiske (1959) used multiple methods to study validity of psychological traits in humans. Campbell and Fiske's study prompted others to begin to mix different methods of data collection and analysis (Sieber, 1973) and eventually led to what is now known as the triangulation of data sources. Recognizing that all methods of inquiry have limitations, it was thought that many of these

limitations could be neutralized, or cancelled out, by implementing more than one methodological approach in the same study (Creswell, 2003). Researchers implementing a mixed methods approach to research base the inquiry on the assumption that collecting diverse types of data provides an enhanced understanding of a research problem. Mixed methods research utilizes both predetermined and emerging methods. This is consistent with both quantitative and qualitative methods, as they both include multiple forms of data, and either statistical or text analysis (Creswell, 2003).

While there are many benefits to mixed methods research, additional challenges often arise. These challenges include the need for extensive data collection, the time-consuming nature of analyzing both text and numeric data, and the requirement for the researcher to be familiar with both quantitative and qualitative forms of research (Creswell, 2003).

2.1.2 Type of Mixed Methods Design

There are a number of different strategies that have been suggested for a mixed methods research design. Recent authors have elaborated on the criteria that are used when choosing a mixed methods approach. Creswell (2003) suggested that there are four decisions that have to be made while selecting a mixed methods strategy of inquiry:

1. What is the implementation sequence of the quantitative and qualitative data collection in the proposed study?
2. What priority will be given to the quantitative and qualitative data collection and analysis?
3. At what stage in the research project will the quantitative and qualitative data and findings be integrated?
4. Will an overall theoretical perspective (e.g. gender, race/ethnicity, lifestyle, class) be used in the study? (p. 211-212)

For this study, a *Sequential Explanatory Design* was implemented, as is illustrated in Figure 2.1. This design was chosen because of its simplicity and straight-forward design with the steps falling into clear, separate phases as well as its flexibility when giving priority to either the quantitative data or the qualitative data (Creswell, 2003).

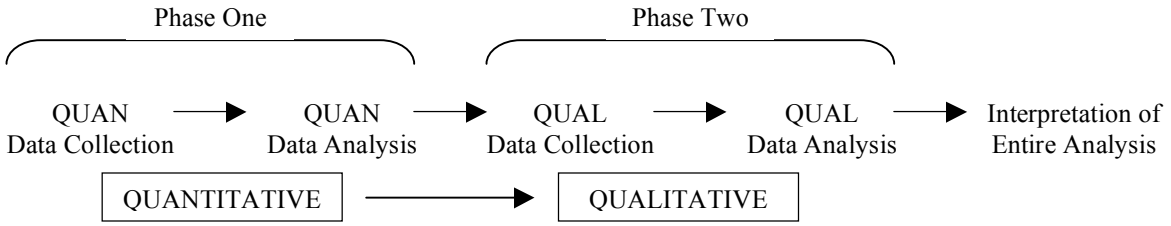

Figure 2.1 Sequential Explanatory Design
From "Research design: Qualitative, quantitative, and mixed methods approaches" by J. W. Creswell, 2003, p. 215.

When choosing the research design for this study, many questions were asked similar to those posed by Creswell (2003). This study's implementation sequence matches that of the suggested model in Figure 2.1 as data were collected one approach at a time, rather than concurrently.

It is traditionally believed that the phase of data collection that comes first is typically the one that carries priority in the study (Creswell, 2003). However, Creswell (2003) maintained that it is possible to give equal priority to both the qualitative and quantitative phases of data collection and analysis. Following Creswell's suggestion, in this study, equal priority was given to both the quantitative and qualitative data being collected, as they complemented each other as well as individually contributed unique and invaluable information and perspective. After the Sequential Explanatory Design was selected as the most appropriate to best fit the intent of the study, a more specific research model was developed and can be seen in Figure 2.2.

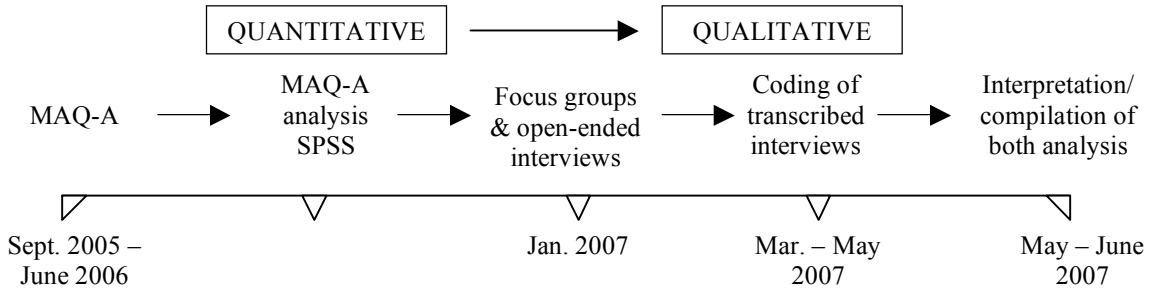

Figure 2.2 Study Design
MAQ-A: Modified Activity Questionnaire for Adolescents
SPSS: Statistical Package for the Social Sciences – computer program for data analysis

2.2 Participants

Phase one. Grade 9 students were recruited from two Saskatchewan high schools. School-NONSEM implemented a non-semestered physical education program while school-SEM implemented a semestered physical education program. These two schools were located in two different cities in Saskatchewan as it was not possible to find two high schools in the same city that utilized different schedules (one semestered and one non-semestered) for physical education. The two schools selected had similar student populations, were located in similar socioeconomic areas of their respective cities, offered comparable physical education programs and school-based physical activity opportunities for students, as well as had the same number of physical education specialists. In addition, these schools had access to similar resources such as physical education specialists, physical education consultants, equipment, and facilities. Both schools had interscholastic sports teams as well as intramural activities run during the lunch hours.

Approval to conduct this study was received from both school divisions and a detailed abstract was presented to the principals of the two selected schools that outlined the intent and details of the study. An effort was made to ensure that all participants understood that participation

was completely voluntary and in no way would declining to participate affect the pay or work environment of the staff participants.

The first phase of the study was introduced to the students through brief presentations made during grade 9 physical education classes. These presentations explained the purpose and format of the study, specifically the quantitative phase (phase one), and what students would be required to do if they chose to participate. A detailed explanation of phase two of the study was not given at this time, as only a select few students would be asked to continue to participate after phase one was completed. For many of the students, participation ended after the completion of phase one of the study.

Students who were interested in participating in phase one were given a detailed abstract, a letter of explanation, and a student assent form and parent consent form to take home for review and approval. To participate, students were required to provide informed assent and their parents were asked to provide informed consent (see Appendix C).

All students who volunteered to participate in this study were informed of their right to withdraw at any time without prejudice or penalty. Anonymity was a priority and the protection of the participants' identity was assured. Confidentiality, of all data provided was also assured to all participants. No names or other means of identification were used in any printed or published reports.

Phase two. A key component of qualitative research is the purposeful selection of participants who will best address the purpose of the study (Creswell, 2003). After the collection and analysis of the data from the first phase of the study, several students from both schools were purposefully selected and asked to participate in the focus group discussions that were used in phase two of this study. The purpose of these focus groups was to gain an understanding of the experiences of grade 9 students in physical education and their perceptions of the role that physical education scheduling

may or may not have on their physical activity levels. All participants understood that participation in the focus groups was entirely voluntary and that their school grades would not be affected in any way if they chose to decline to participate in this phase of the study. Students were selected with the help of the school physical education teachers along with reference to the data collected in phase one of the study to ensure a sample as representative and potentially informative as possible. Criteria for selection included students:

1 Having a range of physical activity levels (both sedentary and active), determined using data collected from phase one of this study.

2 Providing a range of participation levels in both structured and/or unstructured activities.

3 Thought to be good candidates for providing quality discussion while maintaining a level of respect for others in the focus group who may have differing opinions of the topics being discussed.

As previously stated, focus group participants were informed of their right to withdraw at any time without prejudice or penalty. Anonymity was a priority and the protection of the participants' identity was assured. Confidentiality of data provided was also assured to all participants, and no names or other means of identification were used in any printed or published reports.

In addition to the student focus group discussions, individual interviews were conducted with two physical education teachers and one member of the administration team at each school. Two physical education consultants, one representing each school division, were also interviewed individually. These interviews focused on the perceptions that these key decision-makers had on the effect that physical education scheduling may or may not have on physical activity levels of students, and any perceived advantages or disadvantages of the two schedules. The interviews also addressed the objectives of the schools' respective physical education programs, whether or not a

preference exists between the two schedules, and why the current program schedule was being used. Participation was voluntary and each interview was conducted at a time most convenient for the participant. The interview guides that were used for all participants are attached (see Appendix F and Appendix G).

2.3 Phase One Methods

2.3.1 Phase One Data Collection Procedures

To assess the physical activity levels of the participants involved in this study, and to gain an understanding of the effect different physical education schedules (semestered and non-semestered) had on the physical activity levels of grade 9 students, the Modified Activity Questionnaire for Adolescents (MAQ-A) was used (see Appendix E). The MAQ-A is a self-reported measure of physical activity designed specifically for use with youth and adolescents. It asks students to recall all physical activities in which they have participated in the four weeks prior to the completion of the questionnaire. The activities participants were requested to provide were those that took place outside of the physical education class setting. An advantage specific to the MAQ-A is that it is recommended for use with differing ethnic and cultural backgrounds (Spink et al., 2005) making it ideal for this study as both high schools had students from various ethnic backgrounds.

The participants at both schools were asked to complete the MAQ-A on three separate occasions throughout the 10-month school year. The schedule of MAQ-A administration can be seen in Figure 2.3. On all three occasions, instructions were read explaining to participants how to properly complete the questionnaires and to ensure students were aware that completion of the form was voluntary, responses were confidential, and anonymity of the respondents was, and is, guaranteed. After completion, the questionnaires were collected from the students and the data were aggregated and analyzed.

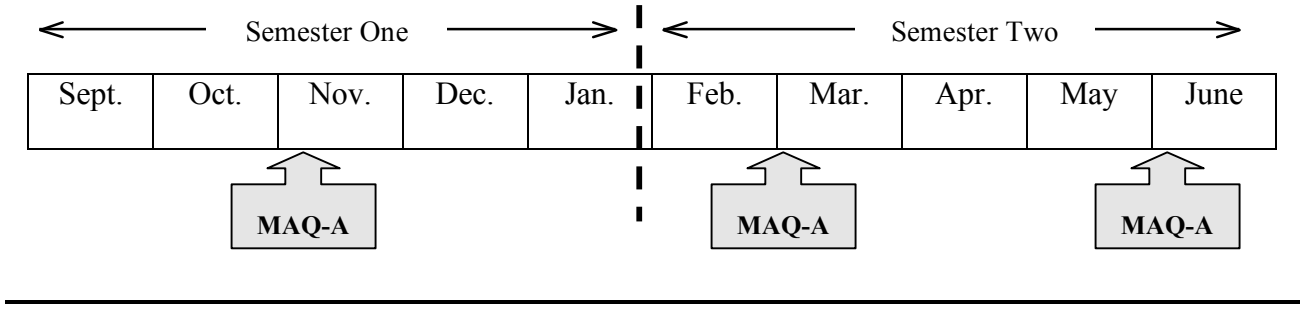

Figure 2.3 MAQ-A Administration Schedule
MAQ-A: Modified Activity Questionnaire for Adolescents

2.3.1.1 Reliability and Validity

The original MAQ-A requested a past-year recall while this study only a 4-week physical activity recall was reported. Similar physical activity recall questionnaires have been found to be highly reproducible when comparing estimates of physical activity obtained at one-year and one-month intervals (Aaron et al., 1995). Recently, in 2005, the MAQ-A was used as a 4-week physical activity recall (Spink et al., 2005). The MAQ-A has demonstrated reliability (r = .79 for 1-month test–retest) and validity (Spearman correlations between the questionnaire and the average of 7-day recalls ranging from .55 to .83) as a self-report measure of physical activity in this population (Aaron et al., 1995). One change that was made from the original questionnaire was the length of the recall being requested.

2.3.2 Quantitative Data Analysis

The data gathered via the MAQ-A was entered onto an Excel spreadsheet. Once entered, the information provided by the participants was used to calculate the energy expenditure of each student using the same method as Spink and colleagues (2005). The energy expenditure was measured using kilocalorie per kilogram of body weight per day (KKD), which is a relative value

used to represent physical activity levels. This calculation was accomplished by multiplying the recalled intensity, duration, and subsequent metabolic cost (MET) values together for each physical activity listed by each participant. This provided what is called a MET minute. The MET minute was then divided by the days involved in the recall (in this case 4 weeks, or 28 days). This value was then divided by 60, which is a correction factor used as 1KKD is equal to 60 MET minutes per day. The sum of individual activity calculations was established for each participant, giving a total number of KKD's for the four-week period. Participants could then be categorized according to activity levels as sedentary (total energy expenditure < 2 KKD) or sufficiently active to gain the full benefits of physical activity (total energy expenditure > 8 KKD). These guidelines followed those used by Spink and colleagues (2005) and were based on the suggestion that in order to obtain optimal health benefits from physical activity, youth and adolescents should be expending 6-8 KKD (Corbin, Pangrazi, & Welk, 1994).

The data was then entered into the Statistical Package for the Social Science (SPSS) and was analyzed for activity trends across individual participants, genders, and physical education programs using an analysis of variance (ANOVA). For example, the average duration of physical activities and the average frequency was examined in both participants enrolled in the semestered and non-semestered physical education programs and findings were compared. To control for family-wise error, post-hoc tests were done using Tukey's HSD. Correlations were investigated between activity levels and other variables (e.g. sex, age, physical education program involvement, etc.).

2.4 Phase Two Methods

2.4.1 Qualitative Data Gathering/Generating

Qualitative data were gathered from multiple sources (students, teachers, and key decision-makers) via focus group discussions and interviews. I conducted all of the interviews and this

allowed me to gain an in-depth understanding of the data gathered. Through these focus groups, an understanding was gained of the students' experiences with physical education and their perceptions that the scheduling of physical education had on the physical activity levels of themselves and their peers. The interviews with the key decision-makers provided an understanding of their perceptions of physical education, of the role that the scheduling of physical education played in students' physical activity levels, and the perceived effectiveness of the semestered and non-semestered physical education programs.

2.4.1.1 Focus groups and interviews

Focus groups were used to explore the experiences of grade 9 students in their physical education programs, and to better understand the impact that the scheduling of physical education had on their physical activity behaviors. Focus groups were used because they have shown to foster a sense of safety, allow for honest conversation and discussion between participants, and they often generate rich, holistic data (Patton, 2002). Denzin and Lincoln (2000) suggested that focus groups using the voices of multiple participants, "reduce the distance between the researcher and the researched" (p.641) and create an environment where honest thought can be expressed.

To maximize the comfort of the participants, and to facilitate a safe environment for discussion, gender and physical activity levels were used as criteria when creating the focus groups. Levels of physical activity for each student participant were determined by averaging the data collected from the three physical activity questionnaires (MAQ-A) completed in phase one of the study. As was done by Spink and colleagues (2005), participants classified as either active enough for healthy growth and development (>8KKD) or sedentary (<2KKD). For the participants that were selected as 'active enough for healthy growth and development' the information collected with the MAQ-A in phase one was also used to further divide the participants into two separate focus groups. One focus group included participants whose physical activity was primarily from

structured activities, whether at school or in the community. The other active focus group included participants who were active in primarily unstructured physical activities. The purpose of the stratification was to add insight into the effect of physical education schedules on activity both within, and outside of, a school setting. At each of the two schools, six focus groups were established consisting of 5-7 participants, a size suggested by Morse and Richards (2002). Table 2.1 provides a description of the six focus groups:

Table 2.1: Description of the Focus Groups

Gender	**Activity Level**	**Associated KKD**
Male	Sedentary	<2KKD
Male	Active enough for healthy growth and development within structured activities	>8KKD
Male	Active enough for healthy growth and development within unstructured activities	>8KKD
Female	Sedentary	<2KKD
Female	Active enough for healthy growth and development within structured activities	>8KKD
Female	Active enough for healthy growth and development within unstructured activities	>8KKD

The focus group discussions were conducted using open-ended questions related to the students' experiences in physical education and the impact that they perceived physical education had on their physical activity levels. The discussions continued until I felt that saturation of information had been met.

Semi-structured interviews were conducted with physical education teachers as well as with one member of the administration team at each of the two schools. These interviews focused on the goals, challenges and successes of the scheduling of the physical education program at each school. Similar interviews were also conducted with the physical education consultant from each school division. The interviews with the consultants provided an understanding of the perceived goals of the physical education programs being used in each school, advantages and disadvantages of each schedule seen by those involved, and the justification for the chosen schedule over the alternate option.

The interview guides used in the focus group discussions and interviews were piloted prior to data collection with individuals who represented the participants in the proposed study. This procedure helped to determine the thoroughness of the questions, competency of my interviewing skills, and participants' willingness to be involved in this type of discussion. I conducted all of the focus group discussions and interviews.

Following guidelines outlined by Patton (2002), all focus group discussions and interviews were recorded using an audiotape recorder and then transcribed verbatim following the discussions. After each focus group interview, I recorded my thoughts, ideas, and reflections in a reflexive journal as suggested by Lincoln and Guba (1985). Interview guides for all participants are attached (see Appendix F and Appendix G).

2.4.2 Qualitative Data Analysis

As the intention was to build an understanding from the data collected, data analysis was an ongoing process throughout the second phase of this study (Morse & Richards, 2002). During data collection, I met with my supervisor, Dr. Louise Humbert, several times to discuss the findings and identify emerging ideas and topics. After the data had been analyzed, the transcripts were sent back

to all participants to be member checked. When requested changes were made, transcript release forms were sent to all of the participants and returned to the researcher.

2.4.2.1 Student Focus Groups

The next step of data analysis commenced after all focus groups and interviews had been conducted and transcribed. Using the procedures consistent with content analysis (Patton, 2002); the transcripts of the focus groups and interviews were reviewed. Each transcript was read several times and coded line by line. Words or sentences that captured the critical issues and thoughts identified by the participants were highlighted. These highlighted passages assisted in the identification of preliminary patterns in the data. These patterns were then identified as categories of information. These categories of information were transferred to poster boards to allow for a visual presentation of this stage of data analysis (Bogdan & Bilklen, 1992), which helped to identify the connections among the categories. These connections were then used to group the categories together, a process identified by Merriam (1998) as clustering. The clusters of categories facilitate the identification of themes within the data.

2.4.3 Trustworthiness of Qualitative Research

Lincoln and Guba (1985) suggest that the level of trust in a study using qualitative methods as a means of data collection can be enhanced through the attention to credibility (or verification), the applicability of the study through transferability, the consistency of the methods and sources through dependability or validation, and neutrality through conformability. The strategies that are to be utilized in the proposed research are outlined in Table 2.2.

Table 2.2: Trustworthiness in the Proposed Research

Trustworthiness Criteria	Application to the Proposed Research
Credibility or Verification *Truth Value*	• Data Triangulation • Data Saturation • Purposeful Sampling • Researcher Credibility
Transferability *Applicability*	• Rich, Thick Description • Homogeneous Sampling Strategy
Dependability or Validation *Consistency*	• Member Checks • Multiple Data Sources
Confirmability *Neutrality*	• Investigator Triangulation

Credibility or verification refers to the amount of "truth value" that the findings of a particular study bring. In this research, this was met in the following ways:

- Qualitative data were collected from multiple sources. They were taken from four separate focus groups involving 5-7 students each and semi-structured interviews with the physical education teachers, school administrators, and directors of education from both school boards.
- The focus groups continued to a point where I decided that information had reached saturation – that no new information was being uncovered.
- The participants for the eight focus groups were selected with the help of the physical education staff as well as the observations from the questionnaires administered earlier in the study (phase one). The MAQ-As were used to establish physical activity levels and organize participants into focus groups ranging from sedentary to active enough for healthy growth and development. Physical education teachers recommend specific students who were more likely be outspoken and opinionated while, at the same time, being respectful of their fellow students.

- In qualitative inquiry, the investigator is the primary instrument for the collection and analysis of data. Although my experience with teaching physical education is limited, my supervisor, whom I worked closely with on all aspects of this study, is a former high school teacher with a strong background in the development, implementation and evaluation of school based physical education programs.
- *Transferability* refers to whether the particular findings of a research project can be applied, or transferred, over to another similar context or situation and still maintain its particular meaning, interpretations, and inferences from the completed study. This was established in the following ways:
- A detailed description of each school environment was presented in an effort to provide context for the data collected. The goal was to provide a thick description of the school environments, describing richly and in great detail all features of the culture (Morse & Richards, 2002, p. 52). Such descriptions attempted to state everything that the reader needed to know in order to best understand the findings. As well, the participants were described as far as their physical activity levels, participation in sports and intramural activities, and their outlooks and perceptions on physical education.
- The sampling strategy remained consistent throughout the study. Recruiting a particular subgroup (grade 9 students with varying degrees of physical activity in their lives) helped facilitate naturalistic generalization or the degree to which two contexts are similar.

Dependability or validation refers to a study's consistency or the soundness and accuracy of the findings. This was achieved in the following ways:

- Member checks were completed in this study in two phases. The first phase happened immediately following the transcription of the focus groups and the semi-structured interview data. These transcripts were sent back to the participants who were asked to

review them for accuracy, send any changes back, and return a signed transcript release form. The next phase happened post-analysis when the analyzed data was sent back to the participants to check the accuracy of my interpretation of the transcripts.

- Multiple data sources were undertaken. Focus groups, interviews, and questionnaires were all used in the data collection process.

Confirmability refers to the objectivity of the data, that the interpretations and findings are legitimate. The confirmability was established using different methods of triangulation. In qualitative research, the convergence of sources of information, views of investigators, different theories, and different methodologies represents the triangulation of ideas to help support the development of themes (Creswell, 1998). Triangulation increases the probability that the findings and their interpretations are an accurate representation of the true experiences of the participants (Lincoln & Guba, 1985). This study implemented three of the forms of triangulation outlined by Stake (1995), and they are:

- Methodological triangulation – the use of many sources of data (e.g. interviews, observations, focus groups, etc.) to find commonalities.
- Investigator triangulation – other researchers take a look at the same scene or phenomenon and collaborate interpretations.
- Data source triangulation – looking to see if the phenomenon or case remains the same at other times, in other spaces, or as persons interact differently.

2.5 Role of the Researcher

As this is a mixed methods study, my role as the researcher changed between phases. During phase one, the quantitative data collection and analysis phase; my role was that of an administrator of the questionnaire, which included the distribution of the MAQ-A, explanation of

the process to participants, and assisting them when needed. During this phase, my role also included the compilation, entry, and analyzing of the data.

In the second phase of this study, the qualitative data collection and analysis, my role was more complex. Participant selection for the interviews and focus, recruitment of the student participants, discussion facilitator and interviewer, and coding of the transcripts were all roles that, as the researcher, I assumed during this phase of the study.

2.6 Potential Ethical Issues

It was my goal, as the researcher, to limit participant risk and to respect vulnerable populations. The objectives of the study were communicated clearly to all students and it was emphasized that their participation was completely voluntary. The students were told they had the right to withdraw at any point in the study with no questions being asked of them and with no consequence to their academic standing. The latter was felt to be important as the study was being done in close relation with teachers and school boards, and the perception may have been that the two were connected and their participation was mandatory.

A potential ethical concern I was aware of was that, during phase two of the data collection, contradicting viewpoints of more than one participant could have resulted in some participants feeling uncomfortable. During recruitment and data collection, it was made clear to participants that they could withdraw from the group at any time without being pursued or questioned. All participants were also asked to be respectful of all group members without limiting their own opinions.

This study was bounded by the ethical guidelines set by the Behavioral Research Ethics Board of the University of Saskatchewan for studies involving human participants in the social sciences. Ethics approval was granted September 27, 2006. The school boards involved provided

written consent for the study to take place within two of its schools. There was no risk to the participants or deception involved in this study.

CHAPTER 3

RESULTS

3.1 Phase One Results

The MAQ-A used in this study was modified to permit the collection of physical activity participation in both structured activities and unstructured activities. This results section will first describe the findings when the two types of activities are combined, producing total physical activity levels, next, the findings for both structured and unstructured physical activity levels individually will be presented.

Before starting the main analysis, the physical activity levels of the participants, measured in KKDs, were screened for outliers – cases with an extreme score (Tabachnick & Fidell, 2001). As these extreme cases may not have represented the intended population, they needed to be controlled for. It was also possible that the cases would have a strong impact on the analysis to follow pulling means toward them. In order to identify and evaluate the presence of outliers, histograms, box plots, and z-scores were used. Histograms and box plots were created and visually inspected by looking for cases that were noticeably outstanding from the rest of the sample. After the Z-scores were calculated they were compared to a value of 3.29. This value was chosen as it identifies cases outside of where 99.9% of the population is thought to be, excluding the extreme 0.1% of the population. The cases with a Z-score higher than 3.29 were identified as outliers and removed from the data. In addition, when looking at histograms and box plots, cases that were visually identified as separate from the rest of the distribution were also removed from the sample. In total, 15 cases were removed, shrinking the sample size and tightening the standard deviation around the mean.

However, even with the outliers removed, quite a range of activity levels were represented within the sample.

3.1.1 Total Physical Activity Levels

A mixed model ANOVA was used to investigate the total physical activity levels of participants at both schools over the three time points. To control for family-wise error, the probability of making one or more false discoveries among all the hypotheses when performing multiple pairwise tests, post-hoc tests were done using Tukey's HSD. The descriptive statistics of this analysis can be seen in Table 3.1. No significant difference was found between the two schools at any of the three time points ($F(1,88) = 1.210$, $p>.05$), nor was a significant interaction found ($F(2,176) = 2.746$, $p>.05$).

3.1.2 Unstructured Physical Activity Levels

The analysis was repeated using only the unstructured physical activities that the participants reported and a significant time effect was found ($HSD = 1.36$, $p<.05$). Like the total physical activity levels, no significant school effect was revealed when looking at only the unstructured physical activities ($F(1,88) = 2.684$, $p>.05$) nor was an interaction found ($F(2,176) = 1.493$, $p>.05$). The descriptive statistics of the unstructured physical activity data can be seen in Table 3.2.

Table 3.1

Total Physical Activity Levels, Descriptive Statistics

Time Point	**School-NONSEM (n=41)** **(Non-semestered PE)** Mean KKD (SD)	**School-SEM (n=49)** **(Semestered PE)** Mean KKD (SD)
October	7.7 (5.8)	8.8 (4.9)
February	10.7 (7.3)	8.3 (6.8)
May	11.4 (9.0)	9.2 (6.2)

3.1.3 Structured Physical Activity Levels

Looking at only the structured physical activities the participants reported, a significant interaction was found between the two schools and the three time points ($F(2,172)=6.056$, $p<.05$). Since a significant time-school interaction was found, the next step in the investigation of the structured physical activity levels was to break that data into individual schools, comparing each on its own over the three time points as well as to each other. The following findings can also be seen graphically in Figure 3.1.

3.1.3.1 Structured Physical Activity Levels at School-NONSEM

Using a the Tukey's HSD test it was found that the students enrolled in School-NONSEM, the school implementing non-semestered physical education, had participation rates in structured physical activities that increased significantly between October (5.154 KKD) and May (7.892 KKD) (HSD = 2.18, $p<.05$). The descriptive statistics for the structured physical activity levels of the participants can be seen in Table 3.3.

3.1.3.2 Structured Physical Activity Levels at School-SEM

The students enrolled in school-SEM, which implemented a semestered physical education program, showed no significant change in physical activity levels (HSD = 2.04, $p>.05$) at any of the three times points. Table 3.3 displays the data for school-SEM.

3.1.3.3 Comparing Structured Physical Activity Levels of School-NONSEM and School-SEM

Using Tukey's HSD post-hoc test, no significant difference was found between the first two time points, October and February, between the two schools. However, a significant difference (HSD = 1.77, $p<.05$) in the structured physical activity levels was found between school-NONSEM and school-SEM between time point two (February) and time point three (May).

3.1.4 Physical Activity Locations

The MAQ-A also asked each participant to record the location where each activity they reported was performed. When comparing the locations of the participants' reported physical activities at both schools, it was found that the students at school-NONSEM had a higher percentage of participants in activities located in their school. This was consistent with both structured and unstructured physical activities. In total, the students at school-NONSEM reported that 23% of all physical activities they were involved in took place at the school. This is compared to school-SEM where the students reported that 16% of their activities took place at the school. The remaining activities reported by the students at school-NONSEM took place in parks (31%) and facilities (46%) such as arenas, stadiums, and fitness centers, whereas the students from school-SEM reported 31% and 53% respectively.

Table 3.2

Unstructured Physical Activity Levels, Descriptive Statistics

Time Point	**School-NONSEM (n=41)** Mean KKD (SD)	**School-SEM (n=49)** Mean KKD (SD)
October	2.6 (3.5)	3.7 (3.3)
February	4.1 (6.0)	4.3 (4.6)
May	3.5 (4.1)	5.6 (5.2)

Table 3.3

Structured Physical Activity Levels, Descriptive Statistics

Time Point	**School-NONSEM (n=41)** Mean KKD (SD)	**School-SEM (n=47)** Mean KKD (SD)
October	5.2 (4.9)	5.3 (5.2)
February	6.6 (6.2)	4.1 (4.4)
May	7.9 (8.2)	3.7 (3.6)

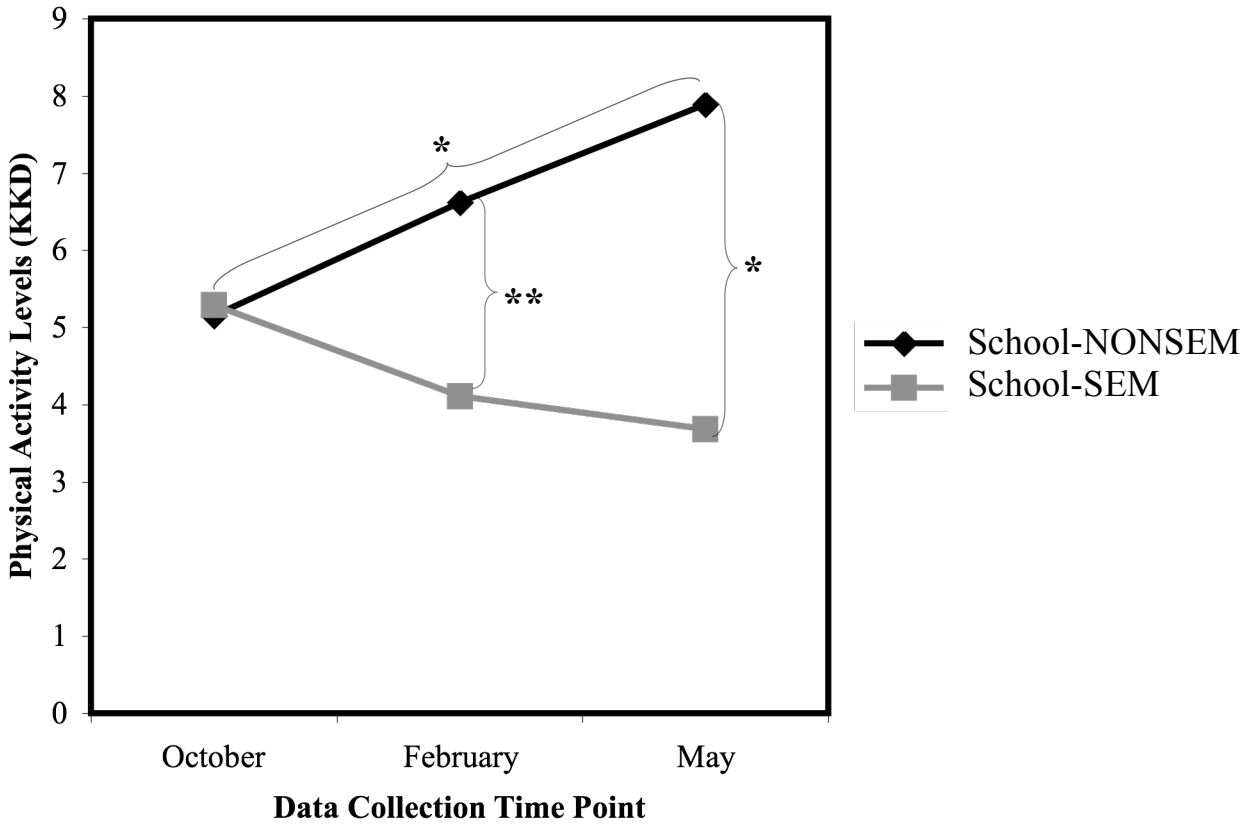

Figure 3.1: Structured Physical Activity Levels

* Significantly different ($p<.05$)

** Significantly different ($p<.1$)

3.2 Phase Two Results

The results are presented in two sections. The first section will present the findings from the seven student focus group discussions. The second section will describe the findings from the interviews with key decision-makers that were involved with the development, support, and implementation of the physical education programs at the two schools involved with this study. Each section will be divided by the themes that arose during the focus groups and interviews. This is done in order to create a comparison between the two schools and, thus, the two different physical education programs.

3.2.1 Student Focus Groups

The purpose of the focus group discussions involving the students was to provide insight into the experiences of high school students in semestered and non-semestered physical education classes. Efforts were also directed at understanding the perceptions of the students regarding the effect that the scheduling of physical education had on their physical activity levels. Using the results obtained from phase one, the students were placed into focus groups based on their activity levels. As previously stated, students who achieved a physical activity level of 8KKD or higher were categorized as *active*, while students who achieved a physical activity level of less than 2KKD were categorized as *inactive*. During this phase of the study, the focus groups were organized by gender and activity level. The attempt to create these activity-specific groups of boys and girls was partially successful. Unfortunately, the male students at both schools were less compliant than the female students and only one focus group of boys could be formed at each school. The activity levels of the boys in each of the two focus groups ranged from sufficiently active for healthy growth and development (in structured and unstructured activity) to sedentary. Another interesting development was that the majority of the inactive girls at both schools were unaware of their low

activity levels and, during the focus group discussions they claimed to be very active. During the focus groups, the girls were not asked to discuss or explain their activity levels. Due to their perception that they were very active (despite the fact that their MAQ-A results indicated that this was not the case), these girls were asked to speculate about what inactive girls would think about the issue of physical education scheduling.

The focus group discussions occurred in the fall of the students' grade 10 year. Many of the students from school-NONSEM were currently enrolled in a semestered grade 10 physical education program. Physical education was mandatory in grade 9 and 10 at school-NONSEM and thus, the students at this school had experience with both types of scheduling. The students attending school-SEM were required to take one additional physical education credit in either grade 10, 11, or 12. Therefore, many of the students involved in the focus groups at this school were not enrolled in physical education during their grade 10 year. All physical education classes at school-SEM were semestered.

Three focus group discussions were held at the school that implemented mandatory non-semestered physical education for grade 9 students (school-NONSEM). Two of these focus groups were with girls; one was comprised of active girls and the other was made up of inactive girls. The active group of girls included a mix of girls who were primarily active in structured activities and those who were active in unstructured activities. The discussions involving the active girls in structured and unstructured physical activities showed no noteworthy differences. Similar to the school offering semestered physical education, the girls at school-NONSEM who were classified as inactive thought that they were active. Thus, they felt that the physical activity they experienced in physical education class was not necessary for their health and well-being. The third focus group at this school was made up of boys, the majority of whom were active. The one inactive boy involved in this focus group was not eager to contribute to the discussion and efforts were made to draw him

into the conversation. On the occasion that this boy spoke, he either agreed with the other, more active, boys in the group or he showed a disinterest in the question posed. The students in these focus groups had already experienced both semestered and non-semestered physical education programs.

Four focus groups were conducted at the school that implemented mandatory semestered physical education for grade 9 students (school-SEM). Three of the focus groups were with girls, and one was with boys. Two of the three groups of girls involved active girls (one active in primarily structured physical activities and one active in primarily unstructured activities) and one group was comprised of inactive girls. Like the finding at school-NONSEM, the inactive girls in the focus group at school-SEM perceived themselves to be active even though their MAQ-A results indicated that they were sedentary. The one focus group of boys included both inactive and active participants.

During the focus groups, the students from both schools described the perceived advantages and disadvantages to both the semestered and non-semestered physical education programs. They also shared their thoughts about the effect that both types of scheduling had on their physical activity levels and on the physical activity levels of their peers. Three themes emerged from the analysis of these focus group discussions. These themes were: (a) One semester or two: student preferences; (b) Physical education and physical activity, and; (c) Physical education and academics. All students, regardless of activity level, gender, or physical education program scheduling, had discussions related to these three themes.

These three themes are used to organize the findings in an attempt to create a comparison between the two schools. The words of the participants and the themes have been member-checked in an attempt to ensure the accuracy of the findings.

3.2.1.1 One Semester or Two: Student Preferences

In general, the participants from school-NONSEM and the participants from school-SEM reported very similar preferences and thoughts regarding the goal of physical education. At both schools, the participants said they were aware that physical activity was important and that increasing physical activity in students was one of the main purposes of physical education class. A girl in semestered physical education said:

> [The goal of physical education] *is getting us to do different activities, not all one thing and to get us involved.* [Teachers] *are supposed to help you to try and be more active.*

However, assuming that was the goal of physical education class, many of the students at both schools claimed that a non-semestered program was an unnecessary use of valuable school time as they were already very active outside of school. Interestingly, the inactive students (determined in phase one) were among these participants claiming to have high activity levels.

Since many students perceived themselves as already active away from the school environment, a number of students from both schools felt as though the extra physical activity that physical education provided was not needed and, thus, their preference would be to finish physical education in one semester. One of the girls from the non-semestered physical education program suggested:

> *There's no real effect on us because we're active outside* [of physical education class] *and we have our sports.*

As the majority of students reported that physical education had no effect on their physical activity levels they were asked to speculate about the preferences of the inactive students, and how the scheduling of physical education may affect them. The consensus across the two schools was that their inactive peers would prefer to finish the class in as little time as possible because these students simply did not enjoy physical education. A few of them put it this way:

They are just lazy. Like, 'I don't want to do this, but I have to'. Like, they just don't try. They just don't make an effort.

They just don't want to do it… cause it's not fun. They are just scared that they are not good enough to do it competitively or something.

The focus group with the inactive girls from school-NONSEM agreed that finishing grade 10 physical education in five months was something appealing about the semestered scheduling. However, the reason given for preferring the semestered schedule was not due to a lack of enjoyment, but rather that it was simply nice have some time away from the gym.

I just like [how] you can do it every day, it gets like a routine so you go to that class, it's usual, and then you give yourself a break the rest of the year instead of going in everyday or every-other day all year. It's easier for me, I guess.

In contrast, the inactive girls at school-SEM did not state that they preferred to get physical education class over with, but they did concede that this was a popular perception.

Like, everyone, if you ask them why they take [physical education], maybe one would say that they enjoy gym… but everyone else would say, 'get it over with.'

It is interesting to note that at school-NONSEM, a group of active girls who had experienced both types of physical education programs (semestered and non-semestered) did not see completing physical education in one semester as something appealing. One girl put it this way:

I like the semestered too but I'm starting to like having it every-other day just because you get some physical activity [all year].

Again, these girls mentioned that some of their peers would prefer to finish physical education in one semester.

Once they're done phys-ed in the first term [in grade 10]*, they're like, 'I never have to do anything again'. They just don't like it.*

At school-SEM, the inactive girls and the active girls had similar frustrations regarding their inactive peers and the constant lack of participation in physical education class. However, they seemed to understand why other girls may not enjoy being in a physical education setting as they

mentioned that it was uncomfortable to be forced to be active with girls they may not know that well, or get along with.

> *In grade 9 it was an issue to have the group of people just kind of standing there like they didn't want to do anything. They just stood there and then the teacher would say something… they would fight it, or they would do it half-heartedly.*

> *It's not who you want to be with or who you would interact with on a daily basis. It is just a random group of girls that you are thrown into a group with and sometimes, if you don't like the people, or they are not as active, or they don't think they are as active, or they think they are above everyone else, well, they don't do anything.*

The girls from school-SEM that were involved more with unstructured activity were undecided as to whether the scheduling of physical education would have any effect on the physical activity levels of active girls.

When discussing with the boys at school-SEM preferences for scheduling physical education, a few suggested they preferred the semestered schedule of physical education because having physical education every day for half a year allowed them to enjoy a break from physical education for the other half of the school year.

> *It is quicker* [to finish physical education] *and it's like, everyday you get a break, not every-other day.*

These boys did not dislike being involved in physical education, but by the end of the semester, they were ready for a break. It was also suggested that student preference of one schedule over the other depended on whether students enjoyed physical education class or not. For example, if a student enjoyed the class, non-semestered physical education would probably be preferred. Putting it as simply as he could, one boy said:

> *I would like it every-other day. It just lasts longer.*

The boys in the focus group at school-NONSEM did not share the same view as the boys from school-SEM, and never mentioned a preference for semestered physical education because it allowed them to complete the class faster. Instead, the boys from school-NONSEM reported

preferring semestered physical education for reasons regarding academic pressures and full school timetables, but not because of a desire to complete physical education as quickly as possible.

In summation, the majority of the students involved in this phase of the study, regardless of the school they were attending, gender, and physical activity level, preferred a semestered physical education program. The reasons that were given as to why they preferred this schedule varied, however the most common was that they did not need the extra physical activity that a non-semestered program would provide them, as they believed they were already sufficiently active. A dislike for physical education was rarely mentioned as a reason the students would prefer to finish the class in one semester. Other common reasons given for preferring a semestered schedule were that students were tired of the class by the end of five months of semestered physical education and that they would like to get the class over with so they could focus on other academic classes.

3.2.1.2 Physical Education and Physical Activity

The ways in which physical education affected physical activity levels emerged as a theme in all focus groups. The majority of the students from both schools agreed that physical education did encourage physical activity in inactive people, but only two girls (both from school-NONSEM) admitted to personally benefiting from the increased opportunity for physical activity that physical education class offered. It was interesting to find that only two of the eight sedentary girls were aware of their own levels of inactivity. One of these inactive girls admitted that the non-semestered schedule of physical education helped her stay active:

> *For me, like, I don't do many sports so having it all year was good for me because actually I stayed active, but now* [that I am done physical education] *I probably won't do anything for a semester.*

In contrast, another inactive girl from school-NONSEM suggested that the semestered physical education schedule helped to increase the participation of the girls in physical education class.

> *People, like, they have it every day so they can get used to it and, 'well, okay, I guess I can do it.' So people get more into it, like, if it is every day.*

She also said that having physical education class every day increased the comfort level of being in the gym, and lowered feelings of self-consciousness that were often associated with physical activity. This made many girls feel more comfortable and they participated more freely in the activities being led by the teacher.

Physical education and physical activity as a theme also reflected the thoughts of the students on the positive effect that non-semestered physical education had on maintaining the interest level of students in physical education classes. The one day break in between physical education classes that the non-semestered schedule provided was believed to offer the rest needed for students to continue to enjoy the class. In addition, the participants discussed that a non semestered schedule helped to motivate them to continue to take physical education after it becomes an optional course in grade 11.

Many participants from both schools said they thought that having physical education all year long encouraged physical activity. The general consensus was that the longer inactive students are connected to the gym, the better. These students recognized the urgency of the situation:

> *Because of the obesity rate and everything, if you can keep* [kids] *active all year long, at least you can in school, then it would probably be better.*

> [For] *people who aren't active outside of school, the non-semestered physical education would be good for them because then they could be active all year around.*

As mentioned previously, the girls in the active focus groups from both schools felt that physical education had no effect on their physical activity levels as they were all involved in many activities outside of school.

> *Gym wasn't really a huge factor for me because I play a lot of league sports and it's just kind of something else* [added to my schedule].

However, the general feeling was that, in the end, it really did not bother them to get more exercise. The girls in these focus groups frequently noted that they considered physical education as a "bonus" to other activities they already were involved in. One of the active girls that had experienced a non-semestered physical education program said:

> *I don't mind it… for me, it's not a big deal to go and do something everyday. It's not like, 'Oh, I'm really tired, I need a day off,' or anything.*

When asked to think about sedentary girls at their school, the active girls at school-NONSEM and school-SEM felt that inactive students would be more active in a non-semestered physical education program. However, the participants reported that many of the girls in their class were eagerly awaiting the end of physical education in grade 10 (semestered) so they did not have to take it again.

> *Lots of students wouldn't do anything else if they didn't have [physical education class]. They're like, 'this is our last semester* [with physical education]*, and then I don't have to do anything'. Then they'll just get really lazy after that.*

Girls in this focus group at school-NONSEM suggested that if physical education were scheduled as a non-semestered program in grades 10, 11 and 12, more students would enroll. These girls believed that it was easy to forget about physical education if students had not taken it for a semester:

> *Probably because you kind of forget about it if you take it first semester and it's like, 'oh well, whatever.'*

These girls explained that if a student in grade 10 had physical education in the first semester and not in the second semester, when it came time to choose their grade 11 classes, it would have been 5 months since they were exposed to physical education. These active students felt that if students do not have physical education they tend to forget about it and not enroll for the next year. If students were enrolled in physical education for the length of the school year, the disconnection from the class, and subsequent overlooking of enrollment, would not be as much of a problem.

The active girls from school-NONSEM reported that their experiences with semestered physical education in grade 10 left them tired of the class by the end of the term and they looked forward to it ending. When physical education became tiresome, they were less likely to participate with as much effort or enjoy the class. These girls said that it was nice to have the day off in between classes with the non-semestered schedule that they experienced the year before in grade 9. These were comments unique to school-NONSEM, most likely because the students at this school had experienced both schedules. One girl suggested:

> *I think I was more interested in the class in grade 9 just because you didn't have to do it every day.*

The students at school-NONSEM had experience with both types of schedules, and they believed that the non-semestered program would help maintain an interest level in physical education for both the active, and the non-active students because of that day off in between classes. Having physical education every day, semestered physical education encouraged some students to dislike the class by the end of the semester.

> [Semestered physical education] *just emphasizes the people that are like, 'I can't wait until this is over so I don't have to do it anymore'.*

At school-SEM, the participants suggested that a major advantage for having physical education go throughout the school year, as is the case with the non-semestered schedule, is that all four seasons are available to the teachers and the students. The participants in these focus groups recognized the fact that physical education was exposing them to activities they would not otherwise experience. They associated this with being more active as well. A couple of girls put it this way:

> *Yea,* [students] *would learn more activities, like things you can do in spring. Like here* [in semestered physical education]*, most of the activities are things you have to do inside because its winter.*

> *Because* [physical education] *was always in first semester…. I have never had second semester* [physical education]*, so you can do spring activities and stuff.*

One participant in the inactive focus group at school-SEM suggested that she thought the activities within physical education class would have more of an effect on physical activity levels than the scheduling would.

> *It might be more the things you do in phys-ed. You can schedule four days of playing field hockey* [which we hate], *and it wouldn't matter the scheduling, we're not going to be as enthusiastic about coming into the gym.*

When intramural activities were discussed with the participants at both schools, the girls in all of the focus groups said that they did not currently participate in intramurals and they doubted that changing the scheduling of physical education would make a difference. It was clear that intramural activities were not of interest to any of the girls involved in the study.

> *I have never actually gone to [intramurals], I just hear it over the intercom, the stupid team names and stuff.*
>
> *I don't think I know any girls* [involved] *in intramurals.*

It was suggested that the only way that participation in intramurals may be affected by the scheduling of physical education, was because students would be forced to have a change of clothes at the school all year long if they were enrolled in a non-semestered physical education program. They agreed that not having a change of clothes at school is a common reason for not participating in any extra-curricular physical activity, school sports teams or intramurals.

The girls at both schools described intramurals as disorganized and of very little interest to themselves or any of the other students they knew. They said:

> *It's hard because not everybody knows how to play* [the activities] *and it's hard to get it organized and stuff, and people don't show up.*
>
> [The activities] *are really disorganized. We did volleyball this year, but the teams would never show up. When you did show up, you just didn't even really play.*

Like many of the girls at both schools, the boys at school-SEM, both active and inactive, agreed that physical education had no effect on their physical activity levels because they were already active enough outside of class time. In addition these boys felt that physical education did not introduce them to new activities or motivate them to be more active. However, when asked to speculate as to how physical education scheduling would affect inactive students, the participants all agreed that non-semestered physical education would help to have them active all year long.

> [With semestered physical education] *students only get exercise for half the year. That's why it's better that you have it the whole year, cause then you're at least doing something every-other day.*

The boys agreed with the girls as intramural participation was thought to be positively affected as all students would be forced to have their gym clothes at school all year and this would make it more likely that they would use them during lunch hour.

> *More people would go to the intramurals and go to the open gyms because your gym clothes are already here.*

The active boys at school-SEM mentioned they would prefer non-semestered physical education because the class seemed to last longer, giving them more opportunities to stay active. This was in direct contrast to the attitude the active girls took towards physical education class at both schools. When these same active boys began to speculate about inactive students, they all felt a non-semestered program would encourage inactive students to be more active through the year, even on the days when they were without physical education because they were constantly being reminded and encouraged to be active. One of the boys suggested that:

> *The days you are not doing phys-ed you probably will do something.*

Again, it was suggested that participation in extra-curricular physical activity (intramurals, school sports teams) might be positively affected by the implementation of non-semestered physical education. However, like the girls at both schools, the boys at school-SEM felt that these extra-

curricular physical activities were not well promoted at their school and that physical education teachers rarely advertised intramural activities or encouraged participation. Different from the girls, the boys felt that an extended amount of time in contact with the gym and the teachers, as is the case with non-semestered physical education, might have a positive effect on participation levels.

> [Physical education] *should be everyday for the whole year. It can make kids want to be active and not be overweight… and be in shape.*

Though most of the participants in this study, males and females, considered themselves to be already active, and stated that non-semestered physical education would provide no benefit to them, the overwhelming consensus was that a non-semestered physical education schedule would encourage inactive students to be more physically active on a regular basis. Many of the participants mentioned that they thought that non-semestered scheduling would encourage intramural activity participation as well as increase enrollment in elective physical education in the later years of high school. The students were very aware of the low physical activity level of the average student, and admitted that something needed to be done to change this. Again, no noticeable differences were identified between genders.

3.2.1.3 Physical Education and Academics

Physical education and academics emerged as a common theme when students discussed their experiences with physical education in relation to other academic classes. This theme included positive and negative comments regarding the effect of physical education on other classes, potential for enrolling in elective physical education class in upper years, and concerns regarding elective physical education. Again, the responses were comparable between the two schools as a number of students in both schools agreed that physical education was a course of lesser importance than other 'more academic' classes.

An idea that emerged during the discussions at both schools was that many academic issues discouraged students from registering in elective physical education. An issue mentioned by all of

the girls was the pressure of the workload from other classes. It was mentioned that students were often unable to take physical education as they could not fit in all of the classes they thought were needed.

> *The problem with me is that I would have taken* [physical education] *this year, but I couldn't because of my other classes.*

The idea that students often had to choose between taking physical education in grades 11 and 12 or getting all of their needed classes was common in all focus groups. It was often seen as one or the other. One girl expressed this bluntly:

> *I don't want to come back here* [to this school] *another year.*

Often at school-SEM, where the additional required physical education class could be deferred so long as it was completed by graduation, students chose to fit this second physical education class in either grade 11 or 12. It was mentioned that there was a lot of pressure to get other more important, classes finished.

> *As long as I can take my maths and sciences, I'll take* [physical education]. *I'm only in grade 10 and I'm already taking two grade 11 sciences.*

The inactive girls at school-NONSEM discussed other timetabling issues regarding physical education. Girls from both schools talked about physical education as a class that might not be taken through all four years of high school if other classes were needed instead.

> *If I need to get those classes, I wouldn't take phys-ed. I would still need a whole bunch of credits and stuff.*

At school-NONSEM, the participants in both the active and inactive focus groups talked about the effect of physical education on the rest of their classes during the day. One active girl mentioned that now that she was finished physical education, she found it harder to wake up in the mornings.

> *I can already see the difference. I'm more tired and not awake. It takes way longer to wake up.*

The girls from the inactive focus group mentioned similar positive effects of morning physical education class.

> *I think it is better for me because I am always half asleep in the morning and I don't feel like doing anything, but after gym, it's like, 'Ah Ha!', I'm awake!*

To have the positive effects of physical education class last all year long, even if it was every-other day, was seen as a benefit by these girls. Physical education was also seen as a good way to reduce stress during busy times of the school year.

The students at school-NONSEM were able to discuss these issues with more first-hand knowledge as they had experienced both semestered and non-semestered physical education. As such, an issue that was discussed by both active and inactive girls involved the pairing of an academic class with physical education. For example, when physical education is scheduled every-other day (non-semestered), another class must also be scheduled every-other day; this is termed backing a class. The girls in the active focus group mentioned the issue of backing physical education with a subject that requires a small workload as a significant factor to their preference of non-semestered physical education. However, the opinions differed within the groups of girls. One viewpoint that was discussed involved the problem of backing of physical education with a difficult class with a heavy workload, as this made it harder for students to balance their homework.

For example, these girls from school-NONSEM said that if science was backed with physical education, it was difficult to recall information from the first months of the year.

> *…all of a sudden they come to the very end of the year and you have to look back on stuff you didn't remember… and you totally don't remember anything.*

This was an experience that the inactive girls agreed with. When talking about how at their school physical education was backed with science in grade 9, one girl said:

> [It needs to be backed with] *something not as complex. It would be a lot easier if it would be another class.*

Contrary to these thoughts, some girls from the same school felt that harder subjects were ideal to back physical education with as it allowed one extra day to finish homework from those classes.

> *I think it was kind of good to have science* [backed with physical education]*...just because you have an extra day to do your homework. That's why I thought it was good to have it separated because I don't usually do my homework the very night that I get it.*

The boys at school-NONSEM agreed with the girls from their school and suggested that a less demanding academic class paired with physical education would make it easier for them to keep up with the academic class material.

> *Well, it's pretty hard with science* [backing physical education] *because then you forget everything you learned the day before.*

When talking about elective physical education in grades 11 and 12, one student said that he did not think the scheduling would make a difference unless the students were able to choose, individually, what subject physical education was going to be backed with. If this were the case, and elective physical education was non-semestered with students being able to choose the class that was backing physical education, more would enroll in elective physical education. Again, all the boys agreed that they would not consider taking physical education in the upper years of high school if they felt they were not able to fit, what they perceived as, their needed courses into their schedules before graduation.

The boys in the study from both schools reported no concerns regarding the pressures or complications involved with having physical education in their timetables. When asked to discuss any pressures that they felt with schoolwork, the boys all seemed unconcerned; not enrolling in physical education for academic reasons (e.g. no space in timetable) had never really occurred to them.

Many participants saw physical education as an expendable high school course that was only taken by students who had the luxury of fitting it into their timetables. During the focus groups it

was suggested that there was pressure to take all of the classes students 'needed', and physical education was usually not one of them. This pressure often pushed students into choosing to get physical education over with as quickly as possible so that they could focus on more demanding courses.

When discussing non-semestered physical education, the students from school-NONSEM suggested that the class that was backed with physical education was an important administrative consideration. It was stated that when more demanding academic classes were backing physical education and running the length of the school year (every-other day), it made information retention more difficult. In general, most of the concerns regarding physical education and other academic classes were raised by the focus groups of girls. This was consistent at both schools. The boys remained, for the most part, apathetic on the subject with only a few comments when prompted.

3.2.2 Interviews with Key Decision-Makers

The purpose of these interviews was to gain an understanding of how teachers and key decision-makers perceived the role that the scheduling of physical education played in the physical activity levels and experiences of high school students. Seven interviews were conducted with key decision-makers involved in the two schools and school divisions involved in this study. Three of these interviews were with physical education teachers (two male and one female), two interviews were with members of both schools' administration, and two interviews were with the school division physical education consultants.

Three interviews were conducted with key decision-makers involved with school-NONSEM, the school that implemented mandatory non-semestered physical education for grade 9 students. Those interviewed included the physical education teacher, the acting principal, and the school division's physical education consultant.

Four interviews were conducted with key decision-makers involved with school-SEM, the school that implemented semestered physical education. The acting vice-principal, and two physical education teachers participated in these interviews. One interview was also conducted with the physical education consultant from the school division in which this school was located.

Three themes emerged during the discussions with the key decision-makers at both schools. These themes were: (a) Physical education and physical activity; (b) Extended contact time, and; (c) Administrative issues.

In general, key decision-makers already involved with non-semestered physical education scheduled programs saw numerous advantages over the semestered scheduling of physical education. Those that were currently involved with only semestered physical education said that advantages could be seen with the non-semestered schedule, but they were not convinced that those advantages were worth the hardships of switching from the semestered program. One of the themes that emerged during these interviews had also been identified in the student focus groups, while the other two themes were unique to the interviews with the key decision-makers.

3.2.2.1 Physical Education and Physical Activity

Physical education and physical activity emerged as a theme as the teachers, administrators and consultants compared the effects of semestered and non-semestered physical education on students' physical activity. The participants from the school using a semestered schedule for their physical education program did not have first hand experience with non-semestered scheduling, thus, they were asked to speculate as to the effects that it would have on the activity levels of students. The participants at school-NONSEM were involved with both schedules as grade 9 physical education was non-semestered at their school and grade 10 was compulsory and semestered. This enabled these participants to make a direct comparison.

The principal at school-NONSEM was very supportive of physical education in general and reported that, regardless of how physical education was scheduled, it was an effective way to combat obesity and the sedentary behaviors of high school students. He suggested that by having physical education class every second day throughout the entire school year, students stayed active longer than they would otherwise. He believed that a major success of his school's physical education program was that many grade 11 and 12's wanted to take physical education, suggesting that the administration and physical education staff were doing something right in 9 and 10 since students, "aren't being turned off".

The physical education teacher at this same school was very pleased that their school implemented non-semestered physical education in grade 9, and commented that he wished that a non-semestered schedule was also utilized for the physical education program in grades 10 through 12. This teacher suggested that he could see no advantages to a semestered physical education program significant enough to discourage the implementation of non-semestered physical education. He agreed with the principal and believed that the non-semestered scheduling had a positive effect on student physical activity levels away from physical education class.

> *With regards to physical activity levels, we have no formalized data, but it's my perception that they are higher* [with non-semestered physical education].

When asked which schedule he thought the students preferred, he said:

> *It would probably be split. Active students would prefer yearlong and the others* [would prefer] *semestered physical education.*

The physical education consultant for school-NONSEM supported the teacher and the vice principal, and said he believed that keeping students involved with physical education all year long kept them connected to the gym and increased their physical activity levels.

> *If the kids* [are] *around a phys-ed program, or participating in physical activity every day... then it changes behaviors. They may participate on weekends and that sort of thing. And I think it is a no-brainer because I feel it really has to change behavior.*

To this consultant, having students active every second day rather than every second semester was a much better option. Again, this was consistent with both the member of the administration and the teacher from school-NONSEM. The principal at the school offering non-semestered physical education said:

> *This way there is more tied into the gym. In theory this would help with the high school athletics. If* [students] *are in the gym, they're more likely to participate in high school athletic activities and that sort of thing. They have more access to the gym. If you are away from the gym you just won't come in. You don't have a locker or you don't have those types of things. So it was just an attempt to get kids more active but throughout the whole school year.*

The principal at school-NONSEM added that a non-semestered physical education program encouraged students to keep active throughout the school year.

> *We know that kids should be active all year long, so why do we have them in PE for only 5 months? It shouldn't be about teaching them good basketball skills, but just a love of being active and here's some activities that you can carry on once you are out of high school.*

According to this principal, the importance of changing attitudes and lifestyles was reflected in the goal of this school's physical education department. He also felt that an advantage to non-semestered physical education was that the classes ran throughout the school year and, thus, through all four seasons. This principal suggested that being exposed to all seasons of the year gave teachers more opportunities to use the outdoors for class time and more options for seasonal activities.

> *It shouldn't be about teaching them good basketball skills, but just a love of being active* [throughout the whole year] *and here's some activities that you can carry on once you are out of high school.*

The consultant for school-NONSEM commented that a lot of work had been done to encourage and teach healthy choices to students. He stated that student health promotion was the major goal of this school division's physical education program. He felt that many positive steps had been taken to meet this goal and the scheduling of non-semestered physical education was an

example of the school division's focus on the health of students. However, regardless of the rationale behind the scheduling change in the physical education program in this school division, some teachers often met these changes in scheduling with reluctance. The consultant from this school division suggested:

> *We always have, as I mentioned, teachers that are traditionalists, and don't want to move with the times.*

In contrast, the physical education consultant of the school division implementing semestered physical education was largely unconvinced that the scheduling of physical education had any effect on the physical activity levels of students. She felt that there was not enough proof that scheduling physical education in one way or the other increased or decreased the physical activity levels of students. Thus, she stated that there was little motivation for the school division to implement any change to the current program. The consultant suggested that there were advantages and disadvantages to both schedules, and both will please some students more than others. She believed that active students were going to stay active, and the inactive students were going to remain sedentary regardless of the scheduling of physical education. She also felt that some students do not care about their physical activity levels and would prefer the semestered schedule because they can get physical education over with.

> *Some students, you know, would like to do their [physical education] and get the darn thing over with, 'don't make me do this for a whole year, please!' That shortens their misery.*

Teachers at both schools suggested that a non-semestered physical education schedule promoted enrollment in elective physical education in grades 11 and 12. The reason the teachers thought that elective physical education would be affected by the scheduling of non-semestered physical education contributed to two of the themes that were found: Physical education and physical activity and extended contact time. The teachers noted that with more consistent contact

with the students, they were able to better promote student physical activity. One of the teachers said:

> *You know that if* [students] *are in phys-ed at least 2 to 3 days a week they're going to get some activity. So, if you want to talk about one of the major attributes of keeping kids active, that's it right there. That would be probably my biggest argument as to why non-semestered would be preferable.*

One of the teachers from school-SEM reported that students frequently admitted that without physical education, they were inactive.

> *…when they're not in phys-ed – you get a lot of kids report back to say that "Gees I haven't done anything since last years phys-ed class"*

The administrator at school-SEM was quick to acknowledge that non-semestered physical education scheduling would have a positive effect on student involvement in school sports teams and intramurals. He reported that in previous years, during the semesters where enrollment in physical education was highest, more students participated in extracurricular activities and participation levels dropped in the second semester of the year when there were not as many students enrolled in physical education classes.

> *If* [students] *have phys-ed in the first semester, we have a lot more* [students] *turn out for volleyball/basketball. It tends to be a good semester. Second semester, basketball has already started and some of these other kids jump into phys-ed in second semester, but what sports are running at the time? Well, there are some but not as many. Our participation levels tend to drop simply because there's not as many kids taking phys-ed. So I think if they were active all the time we'd have more participation. The kids would just be more into it.*

All teachers interviewed also felt that intramural participation would improve if physical education was scheduled every-other day throughout the year, as the students would have a change of clothes with them for the entire 10-month school year. Both teachers suggested the lack of gym clothes at school as a significant factor for the current lack of student involvement in school intramural programs.

> *A lot of times… the kids don't have their change out here at the school. If they are in a phys-ed class, chances are they are going have it. Sometimes the intramurals*

program suffers some setbacks because teams will fold or collapse because more members forgot their stuff.

When asked to speculate as to advantages of the non-semestered physical education program, the physical education consultant for school-SEM suggested that non-semestered physical education created more activity-encouraging opportunities. He felt that when physical education was non semestered, students were active throughout the entire school year and more connected to the gym. He put it simply:

…it allows the opportunity for kids to be active, you know, on a daily basis.

In general, most key-decision-makers suggested that a non-semestered physical education schedule would have a positive effect on the physical activity levels of students, on intramural and school sport team involvement, and on enrolment levels in elective physical education. The physical education consultant from the school division in which school-SEM was occurring, was the only key decision-maker to express skepticism regarding the benefits of non-semestered scheduling. She frequently noted that she did not feel there was enough evidence to justify the implementation of a non-semestered physical education schedule.

3.2.2.2 Extended Contact Time

Extended contact time was a theme that emerged when the advantages of non-semestered physical education were discussed. All of the decision-makers who participated in this study believed that keeping students connected to the gym and connected to the physical education teachers throughout the course of the school year was an advantage of a non-semestered schedule.

The physical education teacher and the principal at school-NONSEM suggested that the main advantage of non-semestered physical education was that physical education teachers were able to stay in contact with students throughout the entire 10-month school year. The physical education teacher believed that if teachers see students every week of the year they have many more opportunities to encourage students to be physically active. The key decision-makers noted that in a

non-semestered program, the more time students remained connected to the gym and the more teachers had opportunities to positively impact their physical activity levels.

> *Regular contact allows teachers the opportunity to encourage and facilitate student activity all year long. A student who took semestered physical education in first semester one year and second semester the second year would go 12 months without regular contact* [with physical education teachers]. *Also, when students are enrolled in phys-ed class, they have a gym locker and are in the gym on a regular basis. Otherwise, out of sight, out of mind!*

The teachers from school-SEM agreed and added that when students were in grade 9 and 10 they were not mature enough to take care of their personal well being and non-semestered physical education provided an opportunity for teachers to help them stay active and healthy throughout an entire school year.

> *I'd certainly like to see 9's and 10's non-semestered. We'd have a couple years with them and they could build a lifestyle so that when they get into situations, like when they are only there one semester, they would have a knowledge base to be able to take accountability for their own personal well being.*
>
> *They are good if* [physical activity] *is all structured but when it is not structured I don't know if they are active enough.*

All of the teachers believed that experiencing all four seasons in physical education (as was the case with non-semestered physical education) benefited the students; they also felt that if physical education were to run all year long, more classes could be scheduled outdoors. This is an important issue in this school as the lack of indoor space negatively impacted the existing physical education program.

> *Well, I think you can take part in all seasons, you know, which would be helpful. Sometimes I find when we do the first semester, there's less days to be outside when compared to the second semester.*

The principal at school-NONSEM also suggested the importance of maintaining contact with the students for as long as possible throughout the school year. He said that with the non-semestered program, all four seasons are available to the physical education teachers, giving them much more variety in the activities they could offer and the environments that they were able to

utilize. When asked how this helped students create a habit of lifelong physical activity, the principal responded:

> *Well I think you can do it in a semestered class as well, although I think one of the benefits of a yearlong* [program] *is that students see all four seasons. Where in a semestered program, you know, you don't have the experience of the traditional fall things. I know they incorporate them but you're stuck in the gym for you know, February, March and April and then you go outside for May and June. I mean that's the biggest thing. It exposes them to more activities throughout the year.*

This principal also felt that high school sport teams benefited from the longer teacher-student contact time involved with non-semestered physical education program.

> *In the fall, if a kid doesn't come out for football or soccer or whatever that fall sport is, the phys-ed* [staff] *would say that, because they have them in the gym, they can approach them. When you think about it, if you go to a semestered class, 50% of the kids are not there in the fall when recruiting happens. 'Why don't you come out for football? You look like you'd enjoy it. You've got the size, etc.'. That kind of subtle recruiting is much easier to do for phys-ed teachers because they have those kids in the gym.*

The vice-principal of school-SEM agreed with the principal at school-NONSEM regarding the importance of having physical education all year long. Like his counterparts at school-NONESEM, the vice-principal at school-SEM suggested that the idea of having physical education all year long was, in theory, a good one. He admitted that having the students exposed to physical education throughout the ten months in school would probably help create good habits.

> *Activity just become part of your life, and it's more likely that that will translate over outside of school time. To semesterize* [physical education] *I think is a disservice to the kids. It should be non-semestered.*

However, as advantageous as it would be to have teachers in contact with students all year long, this administrator felt it would be a scheduling nightmare due to the current over-crowding in the school caused by excessive high school enrollment.

The physical education consultant for school-NONSEM also felt the increased opportunity for teachers to establish relationships with the students was an advantage of the non-semestered schedule. He believed that the more 'face time' teachers had with the students, the more they could

promote other physical activity opportunities for students. Thus, the teachers could use this contact time to encourage student involvement in intramural activities and school sport teams. The consultant suggested the increased contact time that teachers have with students in the non-semestered physical education program encouraged students to stay active.

> *They're more tied into the gym, in theory this would help with the high school athletics. If they are in the gym they're more likely to participate in high school athletic activities and that sort of thing. They have more access to the gym and its just the whole thing of them being around there. If you are away from the gym, you just won't come in. You don't have a locker, or you don't have those types of things.*

Though the physical education consultant at school-SEM admitted there were some advantages that could be seen for non-semestered physical education, she remained unconvinced that the benefits would outweigh the inconveniences that she foresaw with the non-semestered schedule. More specifically, she speculated that the few advantages to student activity levels would not be worth the scheduling problems for the administration and staff that would accompany the switch. She suggested that, in theory, there was an advantage to having students exposed to physical education all year rather than one semester, as the longer a student is exposed to a subject, the better it is for learning.

> *You can probably look at that from the perspective of if you are trying to teach a language to someone, do you want them to have exposure to the language for 5 months or do you want them to have the exposure to the language for 10 months? Maybe it's a bigger picture of how kids learn.*

Conversely, this consultant defended semestered physical education as she suggested that if motivating students to be active is the main goal of physical education, teachers might be able to do that in five months just as effectively as 10. The school division physical education consultant reiterated the idea that the extended exposure to physical education classes and teachers may increase the physical activity levels of students but she did not feel that she had enough evidence to consider recommending a change to current practices within her school division.

Again, the physical education consultant involved with school-SEM was the only participant that was not of the opinion that the extended contact time (that teachers had with students) in a non-semestered schedule would be beneficial enough to merit the change from a semestered program. All other key decision-makers, the teachers and administrators from both schools, suggested that maintaining contact with students over all 10 months of the school year would give the teachers many more opportunities to encourage students to be physically active. The consensus was that the more 'face time' teachers had with students, the stronger relationships they would be able to build with each of them.

3.2.2.3 Administrative Issues

Administrative issues emerged as a common theme when key decision-makers discussed student and staff experiences with physical education and other academic classes. This theme included positive and negative comments regarding physical education's effects on other classes, administrative hardships associated with the scheduling of non-semestered classes, and concerns involved in elective physical education.

An issue that was discovered halfway through this phase of the study was that student enrollment in school-SEM greatly exceeded the capacity of the building. This created numerous difficulties and frustrations for administrators as limited on-site space was available for the number of physical education classes scheduled. The other school involved in the study (offering non-semestered physical education) did not have this enrollment challenge.

The teachers at school-SEM considered the over-crowding an important issue as students enrolled in physical education did not have access to appropriate facilities since many classes shared one gymnasium. The teachers at this school said that finding a way to fit all of the students into physical education classes, even with the semestered program, was very difficult and they both felt switching to a non-semestered program would probably make it worse.

> *We've got five periods in the day and we've got 10 classes scheduled, so every period of every day we have 2 classes scheduled. One class will go into the weight room or a classroom and one class gets the gym. They go in the hallway sometimes to do fitness circuits. When the weather is nice we're outside or we're traveling to facilities. So [administration] tries to utilize different space. So, you know, we work around it but there's lots of instances next semester where we have 3 classes scheduled in the same period. It makes it tough to run a quality program when your facilities are an issue.*

Like the consultant in the same school division, the vice principal at school-SEM felt that many advantages existed for the non-semestered physical education schedule, but those did not outweigh the difficulty and inconveniences related to switching from the semestered program. The school building was designed for about 450 to 500 students and currently 800 students were enrolled. This overload caused all sorts of scheduling frustrations for the administration, and adding a switch in physical education, complicating the timetable, was probably not feasible at that time. This administrator noted that ideally, non-semestered would be the right choice, but it was not practical for this school.

> *We did flirt with the idea* [of non-semestered physical education] *because we believe that daily physical education would be best for the kids – keeping them active every day. But logistically it just wasn't going to work… because we would have semestered and non- semestered classes* [at the same time], *staffing would be an issue because if I've got some staff doing semestered courses and some doing non-semestered courses... logistically its hard to schedule them all.*

At school-NONSEM, the physical education teacher acknowledged that semestered scheduling was easier for the administration; however, he felt that this did not outweigh the potential advantages of the non-semestered program.

The principal at school-NONSEM was aware that the pressures of academics were a concern for students. The observation that students found certain schedules of academics more challenging than others, some discouraging enrollment in physical education, made this an administrative issue. He admitted that, at times, students were receiving mixed messages. On one hand they have been told that physical education is important. On the other hand, students were being told to take as

many "academic" (biology, chemistry, physics, English, mathematics) classes as possible to keep all of their options open for the future. For many students, physical education was not seen to be an important class for their future.

> *The message is, don't close any doors. So kids take all of the classes they think they might need and don't have time for physical education.*

This attitude that physical education was unimportant accounted for some students wanting to finish their mandatory physical education classes in one semester. For many of these students, getting physical education class out of the way allowed them to focus on the classes that they felt they would need.

Another issue raised by the administrator at school-SEM, was the difficulty he faced when dealing with students moving from school to school within the city. Since most schools were not backing physical education with the same course, it made it difficult for him to create timetables for students who transfer between schools. Another major problem was convincing a department to agree to back their subject with physical education as it increased teacher workload (more marking, parent-teacher interviews, and evaluations). In addition, the non-semestered schedule created a problem when classes were cancelled for uncontrolled reasons such as pep rallies and holidays. The problem was because with a non-semestered schedule, teachers may see the students only twice a week on some weeks and having one class cancelled would cut their time with the students in half.

The physical education consultant for school-NONSEM stated that in the past, non-semestered scheduling had been attempted at the grade 10 level of physical education but it was abandoned due to scheduling conflicts. He also said that there was no doubt that the semestered scheduling of any class was easier from the administration standpoint. Regardless, this consultant suggested that the scheduling hardships for administration and teachers were worth the promotion of physical activity for students. He believed that the more the students were exposed to physical activity, the more they would be motivated to participate.

> *The idea is that if kids are around a PE program every day and in motion, then it changes behaviors. So, they may participate on weekends.*

When the physical education consultant for school-SEM was asked if she thought that the scheduling of physical education would have any effect on increasing enrollment in upper-years, elective physical education, she suggested that the opposite effect might occur. She believed that having physical education last throughout the course of a school year might actually discourage enrolment in elective physical education in upper years.

> *Kids at that age are conditioned to be thinking that you can complete a course in a semester and then you are done with it and then I move on.*

She felt strongly that taking this familiarity away from students, and further complicating their schedules might be enough to push them away from physical education all together and push them towards classes with more typical schedules.

In summation, it was accepted by all key-decision-makers that the implementation of a non-semestered physical education program provided more administrative hardships than a semestered schedule. The key-decision-makers at school-NONSEM reported that the inconveniences for staff were worth the benefits experienced by the students. The key-decision-makers from school-SEM were less convinced as they were dealing with over-crowding issues in their building with more students than their physical education facilities could accommodate. This over-crowding created problems in the current semestered schedule, thus they felt that attempting to implement a non-semestered program was unrealistic at the present time.

CHAPTER 4

DISCUSSION

4.1 Discussion

Regardless of research findings that indicate that regular physical activity is an essential component for the healthy growth and development of children and youth (Public Health Agency of Canada, 2006), Canadian adolescents remain inactive (Craig & Cameron, 2004). Searching for a way to address the inactivity of adolescents, research suggests that physical education programs can encourage more physically active lifestyles within, and away from, the school environment (Mandigo, 2004). Research has shown that as youth move into the adolescent stage of life, motivation to adhere to regular physical activity declines (Baranowski et al., 2000b) making the early teenage years a critical time for intervention. Educating children and adolescents about the importance of exercise and nutrition, and providing them with opportunities to be physically active, can encourage the development of good, healthy habits that will follow them throughout their lives and possibly alleviate some health concerns currently associated with inactivity (Sallis et al., 1997). The school is an environment through which this information can effectively be delivered to youth (Wallhead & Buckworth, 2004).

In high schools across Saskatchewan, two different schedules are commonly used for high school physical education programs with no evidence to support either as a more effective way of promoting physical activity in, and away from, the school. As such, the purpose of this mixed methods study was to explore the effects of physical education scheduling on the physical activity

behaviors and experiences of high school students and to understand the experiences and perceptions of students and key decision-makers.

To best address the purpose of this study, two phases were implemented. The first phase investigated the differences in physical activity levels of students enrolled in both types of physical education programs in Saskatchewan. The second phase of this study was qualitative in nature and, using focus groups, sought to explore the experiences of high school students enrolled in semestered and non-semestered physical education programs. These focus groups also investigated the student perceptions of how the different physical education schedules affected the physical activity levels of themselves and other students. The second phase also sought to understand the role the scheduling of physical education plays in physical activity levels and experiences of high school students from the perspective of physical education teachers, high school administration members, and school board physical education consultants.

4.2 Phase One: Quantitative

The purpose of the first phase of this study was to investigate the differences in the physical activity levels of high school students enrolled in semestered and non-semestered physical education programs. The hypothesis was that students enrolled in a non-semestered physical education program would maintain physical activity levels as the school year progressed. It has been shown that quality physical education can encourage student physical activity (Mandigo, 2004; Gordon-Larsen, McMurray & Popkin, 1999), thus, it seemed logical that having physical education in both semesters, as is the case with non-semestered scheduling, would help to keep student physical activity levels from dropping during the school year. In reality, students at both schools (students enrolled in semestered as well as students enrolled in non-semestered physical education) maintained their levels of total physical activity throughout the school year. The students enrolled

in the non-semestered physical education program showed a trend of increasing total physical activity throughout the school year, but these changes were not statistically significant. It is possible that with a higher level of participant compliance, this trend would have been shown to be significant. It was found, however, that a higher percentage of reported physical activities at the school implementing non-semestered physical education took place at the school. This suggests that having students in contact with the gym and the physical education teachers throughout the course of the school year may encourage the use of schools' facilities.

As previously mentioned, the total physical activity levels of each participant were separated into structured and unstructured activities. When examining structured physical activities (defined as activities that had to be registered in or signed up for) a significant difference was found between the structured physical activity levels of the students involved in the two physical education programs. In October, the students from both schools reported similar levels of structured physical activity. Research has shown that as youth move through adolescence, their physical activity levels drop significantly (Sallis, 2000; Bungum & Vincent, 1997). However, in this study, as the school year progressed, the average physical activity level of the students enrolled in non-semestered physical education rose. At the same time that there was a rise in student structured physical activity levels at school-NONSEM, students enrolled in school-SEM (the school with the semestered physical education program) reported a decrease in structured physical activity. By the May data collection point, there was a significant difference between the two schools in student involvement in structured physical activity. This would suggest that the scheduling of physical education may have played a role in encouraging student participation in structured physical activity.

These findings support CAHPERD's (2006) publication, "Quality Daily Physical Education", that reported that involvement in physical education programs may encourage students

to engage in more physically active lifestyles within, and away from, the school environment. Though CAHPERD does not specify the type of physical activity that physical education programs encourage (structured, unstructured, or both), it is possible that participation in sports teams and other structured activities may be positively affected by participation in physical education. Thus, physical education is a way to potentially encourage as many students as possible to be involved in structured physical activity like school sports teams, and if non-semestered physical education promotes this participation, it should be implemented as often as possible.

The increase in student involvement in structured physical activity found in this study is consistent with findings from Mota (2002) who found that as age increases, structured physical activity becomes a relatively larger component of youths' total physical activity levels. One could speculate that high schools encourage structured physical activity more than unstructured activity because of the facilities and supervision available. These findings are promising, particularly in Canada where the winter weather often makes it difficult to encourage children to be physically active throughout the year (Canadian Society for Exercise Physiology, 2007). The finding that non-semestered physical education may improve student physical activity levels is good news to those who believe in physical educations' potential impact on youth and its ability to encourage adolescents to be more physically active. It is known that physical activity levels decline with age and that this decline is most prominent around the adolescent years (Sallis, 2000). However the results of this study suggest that there may be a way to contradict this pattern and, as long as students are connected to physical education, physical activity is being encouraged.

Research has shown that adults who report having participated in interscholastic sports teams when they were younger are more likely to have weekly physical activity as an adult (NASPE, 2002). While the current study did not have the students report the specific structured activities they were involved in, it is possible that school sports teams were involved in these

structured activities reported by the participants and, thus, is encouraging to those promoting physical education as a vehicle for encouraging lifelong healthy habits. It has also been found that high school students who are involved with school sports teams had higher grades than those who did not participate (Thompson et al., 2001). This helps endorse the idea that students can experience the advantages of regular physical education as part of their school timetable without the physical education being an academic liability.

Through all three data collection points, October, February, and May, the participants at both schools showed an average energy expenditure level equal to, or greater than, the target of 8KKD, which is the amount of physical activity recommended as sufficient for healthy growth and development (Spink et al., 2005). At first glance, this seems very positive. However, these results should be interpreted cautiously. First, the average physical activity level of the participants involved includes the students with extremely high levels of physical activity. Some of these very active participants reported physical activity levels upwards of 30KKD per day whereas some students reported activity levels between 0KKD and 2KKD. The values of the inactive participants may be masked by the values of very active participants, as their high levels of physical activity may be raising the group average. Secondly, it should be recognized that the instrument being used, the MAQ-A, is a self-report measure of physical activity. This is a subjective measure that tends to overestimate the actual physical activity levels of the participants (Sallis & Saelens, 2000). Thus, in reality, the 8KKD that was reported as the average totally physical activity level for the participants in this study may be an exaggeration of the truth.

The findings from this phase of the study may be partially deceiving to parents, researchers, and health practitioners. At first glance it seems encouraging that the physical activity levels of the students at both schools were, at least, maintained throughout the year. Granted, this is a more positive finding than a decline in physical activity levels would have been, the level of physical

activity being maintained by the participants in this study is still below the current recommendations. The current recommendations set by Health Canada (2002) are 90 minutes of moderate to vigorous physical activity every day. This recommendation includes at least 30 minutes of vigorous physical activity (roughly 6KKD) and at least 60 minutes of moderate physical activity (roughly 3KKD) (Health Canada, 2002). If the goal is 90 minutes of moderate to vigorous physical activity everyday for youth, maintenance of current physical activity levels of Canadian youth (what semestered physical education was found to do in the study) is not good enough as this goal is not being met. This study's findings suggest that increases need to be seen in the current physical activity levels of many youth and adolescents in order to reach Health Canada's recommendations.

It has been suggested that research is needed that examines possible reasons or determinants for participation of youth in structured and unstructured physical activities (Healthy Active Kids Canada, 2007). This seems logical as the more is known about the issue of youth inactivity, the more likely effective strategies for addressing it can be designed and implemented. This study may be a step in the right direction as the findings from this research suggest that physical education may have a positive effect on structured physical activity. This study adds to the suggestion from Healthy Active Kids Canada (2007) and recommends that structured and unstructured physical activity need to be examined separately, as each may be encouraged in youth differently. For example, if physical education class is useful in the promotion of structured physical activity involvement, perhaps there are environments that can endorse unstructured physical activity.

The differences in participation levels between two schools may be partly attributed to issues of access to appropriate spaces, or concerns with youth safety. It was discovered in the interviews with the key decision-makers from school-SEM, that the student population exceeded the number that the facilities were originally designed to accommodate. This adds a significant

disadvantage for providing structured physical activity opportunities to the students at school-SEM as the use of school facilities is limited due to the number of possible participants. In these interviews it was mentioned that scheduling physical education classes were difficult and that often three or four classes would be sharing the gymnasium at once. This is consistent with the existing research that reports in Canada, over-crowding in secondary schools is common as almost half of high schools report enrolling more students than the facilities were intended for (CFLRI, 2001). It has also been found that many teachers and administrators consider the facilities to be a major factor to the success of a physical education program (Thompson et al., 2001). It is plausible that this over-crowding may be a discouraging factor for students to be involved in intramural activities and/or school sports teams. It also may be the case that the excess of students creates a less favorable teacher-student ratio, lowering the contact time that teachers have with each student.

4.3 Phase Two: Qualitative

The second phase of this study was qualitative in nature and, using focus groups, sought to explore the experiences of high school students enrolled in semestered and non-semestered physical education programs. Also of interest was how the participants perceived the effect of the different scheduling of physical education programs on their physical activity levels and on the physical activity levels of other students. This second phase also attempted to gain an understanding of the perceived role that the scheduling of physical education plays in physical activity levels and experiences of high school students from the perspective of physical education teachers, high school administration members, school board physical education consultants. From the participants in phase one of this study, a select few were asked to take part in this second phase based on criteria that were outlined earlier in this paper. In general, a number of benefits and advantages of the non-

semestered physical education program schedule were mentioned by students and key decision-makers alike.

The first emergent theme, one semester or two: student preferences outlined the reasons students' preferred semestered or non-semestered physical education. Many of the students from both schools reported preferring the semestered schedule as it allowed them to complete physical education in just one school term rather than having the class throughout the school year. Carlson (1995) determined that 21% of students feel alienated and report hating physical education. Interestingly, and in contrast with Carlson's findings, disliking physical education was rarely stated as being a reason for wanting to get the class over with in one semester. One of the more common reasons that students offered as an explanation for their desire to finish physical education as quickly as possible was the pressure of their academic schedules. It was felt by many of the participants that physical education was a less important subject than some of the other academic classes in their timetables. This finding supports previous research that reports physical education as a subject that is not seen as a priority in Canada (Health Canada, 1999), nor around the world (Hardman & Marshall, 2000). The students involved in this study saw that finishing physical education in one term allowed them to focus on subjects that they felt required more attention and had greater merit. More on academic issues tied to physical education schedules will be discussed later in this section.

Another reason for wanting to get physical education over with that the students involved with semestered physical education mentioned was that establishing a familiar routine was something about the semestered physical education schedule that appealed to them. As high school students, they were used to every class being one semester long. To have physical education scheduled differently than all other classes in their school timetables caused frustrations and confusion. This was not mentioned by any of the students at the school that implemented

semestered physical education and it can be speculated that not having experienced this type of schedule prevented the students from commenting on this issue. The physical education consultant from school-SEM agreed with the students from the same division. She said that students are conditioned to have classes last a certain amount of time, one semester. To disrupt this routine, she said, was to make the class unappealing to many students.

It is interesting to note that the majority of the students classified as inactive claimed to be physically active. These students agreed with the idea that inactivity was a bad thing and that physical education classes provided both a scheduled time and a place for physical activity to be encouraged. However, these students believed that because they were active away from school, they did not need the physical activity that a physical education class could provide. Thus, for these students, physical education classes were not seen as a productive use of their school time. It is interesting that the perception that youth have of their physical activity levels can be so incorrect. However, the existing literature offers a possible explanation. It has been suggested that Canada's general frame of reference for physical activity levels has changed over time (Mendelson, 2007). Though 26% of Canadian children are now either overweight or obese (Sheilds, 2005), Ipsos-Reid (2006) reported that, when asked if their children were overweight or obese, only 9% of Canadian parents indicated that their children were overweight while not one parent claimed to have an obese child. This suggests that there is a current misconception in Canada regarding what it means to be overweight and/or unhealthy. Ipsos-Reid suggests that children may have adopted their parents' inaccurate perception, which supports the findings of this study as the inactive participants claimed to be active.

Physical education and physical activity was the second emergent theme from the student focus groups. This theme discussed student perceptions of the effect that the scheduling of physical education had, or would have, on their physical activity levels.

The girls involved in this study, from both schools and all activity levels, agreed that a non-semestered physical education program would have a positive effect on the physical activity levels of students. The girls from school-NONSEM, who had experienced both types of schedules for physical education (semestered and non-semestered), offered in depth explanations of why they felt the scheduling of physical education affected student physical activity levels. The girls from the school that implemented only semestered physical education responded with less conviction. This difference may be attributed to the fact that students at school -NONSEM had experienced both types of programs, while the students from the other school were forced to speculate. However, all the girls thought that non-semestered physical education would keep sedentary girls active throughout the school year as opposed to just one semester as is the case with the semestered program. Portman (2003) reported that inactive students know that they will not be active once physical education is finished. Though, in Portman's research, the students' awareness of their own inactivity is contrary to the findings in this study, her research does support the idea that physical education is the only source of physical activity of many youth today and that, without it, sedentary lifestyles can follow.

Many of the girls suggested that non-semestered scheduling maintained student interest in physical education whereas the semestered program became tedious because of the lack of a break between days. These same girls said that having physical education class every-other day helped sustain their enjoyment of the class. Much research has been done on athlete over-training and burnout (Lunney, Raedeke & Venables, 2002); perhaps the same concepts apply to general physical activity in youth. It is possible that having physical education every-other day prevents this physical activity burnout. Physical education programs have been incorporated into the Canadian Sport Centres (2006) Long-Term Athlete Development plan as, not only an important step in

developing elite athletes, but also for developing adults that hold lifelong physical activity as an important aspect of leading a balanced life.

The girls from school-NONSEM suggested that non-semestered scheduling positively influenced enrollment in elective physical education in grades 11 and 12. They felt that when physical education was scheduled as a semestered class, and students had an entire term without physical education, they often forgot about the class all together. When it was time to choose their grade 11 classes, and these students had not had physical education since the fall of their grade 10 year, they were not inclined to register for physical education. This finding was not supported by Scantling and Strand (1995) in their investigation of reasons why high school students decided not to enroll in elective physical education. In their study, forgetting to enroll due to time away from physical education was not mentioned by any of the participants.

The boys at the two schools all agreed that a non-semestered schedule for physical education would encourage inactive students to be more active all year long. While the students at both schools said that intramural participation would be improved with a non-semestered physical education schedule; two different reasons were given. The boys from the school utilizing a semestered schedule suggested that it was the extended contact time with the teachers and the gym that would encourage more students to participate. The boys from the non-semestered program, like the girls from their school, said that having a change of clothes at school all year long was enough to encourage more students to partake in intramural activities. These boys felt that not having clothes at school to wear in the gym was a major factor in the lack of student participation.

Unfortunately, for some high school students, physical education is the only physical activity that they are exposed to and when it is scheduled for only one semester and the class ends, these students typically become sedentary and all fitness gains seen while in physical education are lost (Chase et al., 2007). It is this idea that makes the investigation of the impact that the scheduling

of physical education can play on the physical activity levels of students so important. The existing literature supports Chase and colleagues' (2007) idea that physical education has an impact on the physical activity levels of students and adds that teachers can be powerful role models and have lasting effects on the physical activity behaviors of the students enrolled (La Vine & Ray, 2006; Stelzer, 2005; Cardinal & Cardinal, 2001). The high school physical education teachers from both schools suggested that they saw the potential influence they had as well. The teachers in this study felt that non-semestered physical education increased the physical activity levels of high school students. The teachers were adamant that the longer the students were connected to the gym and to the physical education teachers, more students would participate in intramural activities, more students would enroll in elective physical education, and the more active students were going to be in general. This is supported in the literature regarding block scheduling as teachers reported that increased interaction time with students as a major advantage (Bukowski & Stinson, 2000). Not one advantage for semestered physical education was mentioned by any of the three teachers interviewed.

The members of the school administration that were interviewed from both schools agreed with their physical education staffs and stated that they saw advantages to non-semestered physical education as it had a positive effect on the physical activity levels of students. The principal from the school offering the non-semestered physical education schedule believed that the more contact time that teachers had with students in the non-semestered program, the more time they had to encourage and motivate the students to be physically active. Both administrators agreed with all of the physical education teachers in this study that the *extended contact time* (an emerging theme during the interviews with the key decision-makers) that physical education teachers would have with students in the non-semestered program was advantageous. Supporting the extended contact time that non-semestered scheduling offers, Bukowski & Stinson (2000) reported that the more time

teachers had with students, the more personal the learning environment became and the more teachers could learn the specific needs of individual students. The vice principal from school-SEM noticed an increase in extracurricular physical activities in the semesters where physical education enrollment was highest. He said the main issue preventing the school administration from making the change to non-semestered physical education from semestered physical education was the anticipated difficulty in the planning and implementation of a non-semestered schedule. This supports the literature that expresses some teacher concerns and difficulties with alternate schedules in high schools (i.e. block scheduling) (Bukowski & Stinson, 2000).

When speaking with the physical education consultants from both school divisions, differences were noticed in their perceptions and opinions regarding the effects of non-semestered and semestered physical education programs on student physical activity levels. The consultant from school-SEM suggested that there were advantages and disadvantages to both schedules and that there was not enough evidence to support non-semestered physical education to motivate the division to make the switch. Bukowski & Stinson (2000) share this feeling of indifference as they suggest that there are few advantages to changing class schedules reported in the literature to date. In contrast to the consultant from school-SEM, the consultant from school-NONSEM was very supportive of non-semestered scheduling. He said that if the message that is being promoted to students is to be active all year long, then it only made sense to have physical education last as long as possible. He also felt that the extended contact time increased the accountability of the students to the physical education teachers and could be used to motivate them to be more active.

The importance of academic classes and their effect on physical education classes was the final theme that arose from the discussions with the students. A common perception was that in their upper years of high school, students were being forced to make the choice between taking physical education and taking the classes that they needed to further pursue their future goals (e.g.

university). Scantling, Strand, Lackey, and McAleese (1997) also reported that high school students are very concerned with meeting college entrance requirements, and time is a limiting factor when considering physical education as an elective course. This concern was most commonly discussed by the girls but was shared by a few of the boys as well. In the simplest terms, these students stated they would only take elective physical education if they had the time. As the focus group discussions continued, it became evident that, for most students involved in this study, physical education class was less of a priority than other academic classes. Previous research has shown that many students experience a great deal of intrinsic and extrinsic pressure to achieve academic success (Fisher, 1994). This attitude was seen in both genders and all activity levels. Many of the key decision-makers supported this idea as they reported noticing that students felt that they had to choose between physical education and finishing necessary classes. The notion that physical education is a class of lesser importance to students than other classes is supported in the literature as Gabbard (2000) states, "many administrators express the view that, while acknowledging that physical education is important to child development and school activities, they consider it to be an enrichment or frill unworthy of high priority, especially if a school's goal is improving poor academic performance". Mendelson (2007) stated that, in a time when the problem of childhood obesity needs to be addressed more than ever, physical education class is becoming increasingly trivial in the high schools today. However, research has shown that physical activity during the school day is not an academic liability but, in fact, encourages better academic performances (Le Masurier & Corbin, 2006).

Also regarding academics, it was suggested by the students from school-NONSEM that consideration should be given to the class that the administration backs with physical education. The students suggested classes get harder for students when they are scheduled every-other day, over the entire length of the school year as preparation for year-end exams was more difficult as

students were being forced to recall material from as long as nine months prior. When asked how this might be fixed, the students suggested that backing physical education with a class involving a smaller workload would be advantageous. However, as limited research exists that investigates non-semestered scheduling; the current literature is also lacking studies that investigate the effect of backing physical education with specific classes on student performance.

4.4 Interpretation of Entire Analysis

An advantage to mixed methods research is that the two traditions can often complement each other. It was the goal of this study to have the result from one phase of the research pose questions that the other may be able to further examine.

Most focus group participants reported that the scheduling of physical education did not have much of an effect on their physical activity levels, as they were participating in regular physical activity outside of physical education class. It seemed at times that many of the participants were reluctant to admit physical education would have any effect on their personal physical activity levels. Therefore, participants were often asked to speculate as to what other students, not themselves, thought or would prefer in regards to these two physical education schedules. The two focus groups that were comprised of sedentary females, one group from each school, had similar responses, as did the extremely active groups. Many of the participants in both of the sedentary groups talked about their inactive classmates and how they all needed to be more physically active. These inactive girls thought that the non-semestered physical education class would be beneficial to other girls as it would keep them active all year long.

It has been shown that when children and youth self-report their physical activity (like the MAQ-A), they tend to overestimate their activity levels (Sallis & Saelens, 2000). Thus, the amount of activity recorded by the inactive students in this study may have been lower then reported. This

is a cause for concern. Despite efforts by the health community and schools to promote physical activity, the students in this study were unaware of what it means to be physically active.

The results from the first phase of the study indicate that student participation in structured activities increased during the year for the students enrolled in non-semestered physical education and were significantly higher than the students enrolled in semestered physical education. The key decision-makers suggested that non-semestered physical education encouraged school sport involvement. One administrator reported high levels of school sport team involvement in semesters where most students were enrolled in physical education class. He believed that non-semestered scheduling of physical education contributed to the rise in school sport involvement.

In general, both the students and the key decision-makers agreed that a non-semestered physical education program would encourage all students to be more physically active throughout the school year. They also agreed that the implementation of this type of a schedule would have a positive affect on student enrollment in elective physical education in grades 11 and 12, as well as intramural and school sport team involvement. All of the participants in the student stressed the importance of keeping students connected to the gym throughout the school year, as this would help students remain involved in intramural and extracurricular activities.

In general, the students suggested they preferred the semestered schedule for physical education. The most common reason given for this was that students did not see themselves as needing the extra physical activity that the non-semestered schedule would provide them. Thus, they would prefer to get the class over with so that they could focus on other academic classes and sport teams. Consistently, many of the key decision-makers suggested that many of the students would prefer a semestered physical education program to the non-semestered program. They suggested that, for many reasons, students would just want to get the class over with. This

speculation was accurate and the majority of the students involved in the focus groups reported preferring the semestered program.

A reoccurring theme reported by the students involved in the focus groups was the relationship between other classes and physical education. Many students noted that they needed to be active for their health but felt that with the pressure to prepare for life after high school, physical education was a course that could be omitted from their plans. Many of the teachers and members of administration suggested that students were being forced to carefully examine their school timetables and make sure that they were 'covering all of their bases'. Many of the key decision-makers suggested that the message being given to students was to leave as many options open as possible for post-secondary education, and that these options rarely included physical education.

4.5 Strengths and Limitations

The strengths of this study have been shown throughout this thesis and will briefly be mentioned in this section. However, as is true with all research, there are some limitations that go along with the strengths of this study. This section will begin with a brief overview of the limitations associated with mixed methods research. This will be followed by a discussion of the methodological limitations.

The main strength of this research was the holistic and multifaceted nature of mixed methods research as well as the attention paid to establishing the trustworthiness of the qualitative phase. This included investigator triangulation, multiple data sources, member checking, and a rich description of the research environments. I conducted all interviews and focus groups, which allowed me to have the best possible understanding of the data and how it all fits together.

Although the goal of mixed methods research is to fill as many of the limitations associated with both quantitative and qualitative types of inquiry, some still exist. One of the components of

qualitative research that is a topic of discussion is the issue of what can be done with the findings. Although the goal of qualitative research is often perceived as to transfer knowledge findings to similar situations rather than to generalize (Lincoln & Guba, 1985), it has also been said that some qualitative research can be generalized (Yin, 1989). This was an issue with this study as a possible goal was to inform key decision-makers involved with high school physical education so that appropriate and influential changes might be made. The idea that the results from this study are representative of all Saskatchewan and/or Canadian high schools would probably be naïve.

Another limitation of this study was that a large time commitment was involved for the students choosing to participate. This time commitment was discussed with the students at both schools before the study began in an attempt to inform potential participants of the time that was required. In spite of researcher efforts, many students did not complete the entire study. Throughout the first phase of the study, 229 students participated. However, to participate in this study, students were required to complete the MAQ-A at all three of the data collection periods, October, February, and May. The number of participants that fulfilled this criterion was only 89, or 39% of the participants who volunteered to be part of this study. There are a few reasons why this may have happened. The length of the study may have been an issue as well as the lack of contact with the students throughout the study. It seemed easy for students to forget that they were involved in the study from one time point to the other. Every data collection point took place during one school period. However, due to unpredictable and inconsistent availability of the students, school administration, and weather affecting my travel to the sites, scheduling each data collection period was difficult. It was also hard to keep the students motivated to return and continue their participation over all three data collection points, as there was no incentive offered. This significant decrease in participants may have had an effect on the statistical significance of

some of the results from this first phase of the study. There were several differences approaching significance that, with the extra statistical power, may have achieved an acceptable alpha level.

An additional limitation involved the instrument that was used to determine physical activity levels. The MAQ-A is a self-report measure of physical activity. It has been shown that there is a tendency for adolescent participants to over-estimate their physical activity levels when using self-report measures (Sallis & Saelens, 2000). Recently, the accuracy and validity of self-report measures of physical activity has come into question. Dishman (2007) suggested that the nonequivalent nature of self-report measures is problematic for researchers as such measures are often unreliable and inconsistent. He stated that if participants interpret questions differently or if something influences their interpretation of the questions, then differences in physical activity levels reported between groups may not reflect true differences.

Compliance was also an issue during the second phase of the study when I attempted to recruit students for the focus group discussions. The small number of volunteers made it difficult to create focus groups with the desired number of participants with the same activity level. Because the extreme ends of the physical activity levels were used for the focus groups, fewer than the 89 participants were potential candidates for the focus groups. Many of the students selected for the focus groups were difficult to get in contact with and some said that they were not interested in participating. It was also difficult to find a time that worked well for the students involved in each group. In spite of the disappointing number of participants, the themes reported arose frequently in all groups.

More specific than general compliance issues was that of male student participation. Males were the most difficult to encourage their continued participation in first phase of the study, as well were the most likely to reject the invitation to partake in the focus group discussions. This was

unfortunate as the two focus groups that did involve males were excellent and many interesting ideas were suggested. This study could definitely have benefited from increased male participation.

CHAPTER 5

CONCLUSIONS

5.1 Summary and Conclusions

Research has provided inadequate insight into the effects of physical education scheduling on the physical activity levels of high school students. Numerous authors discuss the potentially powerful role that high school physical education classes can play in the fight against adolescent inactivity (Mandigo, 2004; Wallhead & Buckworth, 2004; Story, 1999). However, to date few research studies have investigated the scheduling of physical education; a significant aspect of any physical education program. Therefore, the purpose of this study was to explore the effects of physical education scheduling on the physical activity behaviors and experiences of high school students.

This study involved students from two schools; one school implemented a semestered physical education program and one a non-semestered physical education program for grade 9 students. The use of a two phased, mixed methods approach would address the purpose of the study in the most holistic way possible. The first phase of this study investigated the differences in physical activity levels between students at the two schools. The second phase of this study sought to explore the experiences of high school students enrolled in semestered and non-semestered physical education programs and how they perceived the effect of those different programs on the physical activity levels of themselves and other students.

Findings from the first phase of the current study determined that students enrolled in a non-semestered physical education program participated in more structured physical activity

consistently throughout the school year than students enrolled in a semestered physical education program. In this study structured physical activity included school sports teams as well as intramural activities.

Findings from the second phase of the study had an equal number of students report a preference for semestered physical education as for non-semestered physical education, with many different reasons being given. However, the general consensus of the students was that physical education had a positive affect on the physical activity levels of the high school students, encouraging them to be more physically active. The key decision-makers agreed with the thoughts of the students and reported that they had noticed students more involved in school sports teams when they were enrolled in physical education. Both students and key decision-makers agreed that non-semestered physical education encouraged students to be more physically active because this schedule extended the amount of months in the school year that students were connected to the gym, the physical education teachers, and to some sort of physical activity.

The students involved in the focus groups suggested that most students at their school were inactive and would benefit from the extra physical activity that physical education class provided. However, virtually none of the focus group participants admitted to being one of the inactive students that they described. The majority of these participants suggested that they were already sufficiently active away from physical education; therefore the class had little benefit for them. Interestingly, most of the students in the focus groups that were found to be sedentary in the first phase of this study, said the same thing. This was an interesting finding as it brings into question how aware adolescents are of their actual physical activity level and/or what it means to be physically active.

The pressures of high school academics and the idea of 'keeping all options open' forced students to put physical education on the back burner when it came time to select their classes.

Both key decision-makers and students alike suggested that it was common for students to believe that they did not have time to fit physical education in to their high school schedules once the class became optional. This was consistent regardless of the schedule of physical education, semestered or non-semestered.

The findings from the current study indicate that the scheduling of physical education class is a significant aspect of this "potentially powerful tool" for encouraging physical activity levels in high school students.

5.2 Recommendations for Future Research

The remainder of this chapter will be dedicated to outlining recommendations for future research that have developed from the current study. Based on the findings in this study, there are still gaps in the current literature that need to be addressed regarding the effects of physical education programs on the physical activity levels of high school students. Although this study utilized both quantitative and qualitative approaches to best address the hypothesis and research questions, this topic remains under-researched. A more in-depth understanding of the possible effects of the scheduling of physical education, among other aspects, on the physical activity levels on the youth participating is needed. The issue of youth inactivity is pressing and any improvement that can be made to physical education, one of the best and most effective ways to educate youth and adolescents and motivate them to be active, should be pursued.

An interesting extension of the qualitative research component of this study would be to speak with high school guidance counselors as it is apparent that they play a key role in the selection of classes and the creation of the timetable. These interviews could focus on their perceptions of the role physical education and physical activity play in the health of students.

Guidance counselors may also offer valuable insight into the tension that exists between physical education and other classes.

In light of the findings during the second phase of this research, it is important to invest more time and resources into investigating the actual knowledge level of youth and adolescents regarding what it means to be physically active. The finding that inactive high school students strongly believed that they were sufficiently active was alarming. A great deal of information regarding how important it is to be active can be relayed to youth and adolescents, but if inactive students do not believe the information applies to them, there will not be much of a positive change even if they believe the message. Thus, more research is needed to investigate youth and adolescents' understanding of their own physical activity levels and their perceptions of what it means to be physically active.

A limitation of this study is a lack of generalizability of the results, thus more research is needed to investigate the effects of the scheduling of physical education on the physical activity levels of high school students in different parts of the country, in neighborhoods of cities with lower socioeconomic status. This study looked at different types of physical activity, structured and unstructured, and found that the participants enrolled in a non-semestered physical education program were involved in much higher levels of the former. It is possible that this was tied to other factors that would be seen if a wider range of SES was included. More research similar to this would increase the transferability and credibility of this studies findings.

An area that requires more study is male-specific qualitative research with high school students. In the present research, the boys were far less compliant than the girls leaving many questions regarding how differently boys and girls perceive their experiences in physical education. This may be an important distinction to make, and the present research may not have done it justice. Strategies need to be developed in future research to better ensure the compliance of male

participants. Such strategies may include the incorporation of a reward to motivate participation. In light of the area of this research, it would be appropriate for the reward to encourage physical activity (e.g. passes to a local gym, swimming pool, gift certificate to a running store, etc.). It may also be beneficial to have more than one researcher involved when dealing a large number of participants. This additional researcher could focus their efforts on keeping in contact with the students that expressed interest in participating, but did not follow through on their intentions.

Finally, further research is needed regarding school based intramural activities and to investigate the effects of intramural activities on the activity levels of high school students as well as factors that are encouraging/discouraging student participation. The lunch hours are a time when the gym is available and this is a potentially influential way of getting kids into the gym on their free time, but more needs to be known about how best to encourage them to do that.

It is well documented in the research literature that Canadian youth and adolescents are struggling with low levels of physical activity and that associated health risks are on the rise (Cone, 2004; Tremblay, Katzmarzyk & Willms, 2002; USDHHS, 2001). There is definitely a sense of extreme importance around the promotion of healthier lifestyles for youth and adolescents (Mendelson, 2007). Physical education programs can encourage more physically active lifestyles within, and away from, the school environment (Mandigo, 2004) and are promising for their potential scope, almost all young people 6-16 attend school, and for their potential impact (CDC, 1996). It is because of the possible difference that physical education can make for students' physical activity levels that every effort needs to be made to ensure that the programs being offered are as effective as possible. This means exploring all facets of physical education, the scheduling included.

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APPENDICES

APPENDIX A

Consent/Ascent Form for Student Participants

Consent Form
Students and Parents/Guardians

Title: The Effects of Physical Education Program Scheduling on the Physical Activity Behaviors and Experiences of Grade 9 Students

Dr. Louise Humbert

Associate Professor
College of Kinesiology
University of Saskatchewan
Saskatoon, Saskatchewan
S7N 5C2

We would like to ask for your son or daughter's assistance with a study that is being carried out by the College of Kinesiology at the University of Saskatchewan. The purpose of this study is to investigate the impact of physical education program scheduling on the physical activity experiences and behaviors of grade 9 students. The findings from this project will provide valuable information to assist educators in developing future activity programs for youth.

If your son or daughter decides to volunteer, his/her role will be to participate in a focus group discussion regarding his/her experiences with physical activity within, and outside of, the context of physical education. These focus group discussions will occur outside of school hours (e.g. lunch or after school) and are anticipated to take approximately 60-90 minutes. Participation is entirely voluntary; there will be no reward for participating and no negative consequences for non-participation.

The data collected will be kept as anonymous and confidential as possible, however, due to the nature of the interviews, complete confidentiality cannot be assured as discussion will take place amongst peers. All the information provided through the focus groups will be confidential and stored by Dr. Louise Humbert in a locked office on the University Campus for a minimum of five years after the completion of the study. If your son or daughter wishes, he/she may withdraw from the study at any time. Withdrawal from the study will not affect him/her (his/her grade) in any way.

With your permission and your son's/daughter's permission, the information gained from this study will be used to determine factors affecting youth's maintenance of an active lifestyle. If you and your son or daughter decides that he/she would like to be a part of this study, please complete the attached form. Also, please ask your son or daughter to read this letter and indicate his/her assent as well. If you or your son or daughter has any questions or concerns about this study, please do not hesitate to contact Dr. Louise Humbert (306-966-1070) at any time.

Parents/ Guardians Please Read and Sign Your Consent

I have read and understand the purpose of this study and my son's/daughter's involvement in this study. I am aware that my son/daughter will remain anonymous throughout the study and in any written results of the data collection through participation in this project. I am aware that my son/daughter has the right to refrain from answering any questions that they feel uncomfortable answering and that they have the right withdraw from the study at any time. I acknowledge that I have received a copy of the consent letter for my records. If I have any questions or concerns I can contact Dr. Louise Humbert (306-966-1070) in the College of Kinesiology at the University of Saskatchewan. If I wish to clarify the rights of my son/daughter as a research participant, I may call the Ethics Office (306-966-2084) at the University of Saskatchewan.

I, _____ give permission to allow _____

to participate in the study conducted by the College of Kinesiology.

Signature _____ Date _____

- -

Researcher's Signature _____ Date_____

<u>Students Please Read and Sign Your Assent</u>

I have discussed this study and consent form with the researcher present, and my parents/guardians. I understand the purpose of the study and my involvement. I understand that I have the right to withdraw at any time from the project, or ask to have any of the information that I have given eliminated from the final document. I understand that I have the option to not respond to any questions that I feel uncomfortable with. I understand that participation is voluntary, and is of minimal risk to me. I agree to protect the integrity of others by keeping confidential everything others in the group say during the group session. However, I understand that the researcher cannot guarantee that other members will keep the information confidential.

Signature _____ **Date** _____

- -

Researcher's Signature _____ ***Date***_____

APPENDIX B

Consent Form for Adult Participants

Consent Form
Adult Participants

Title: The Effects of Physical Education Program Scheduling on the Physical Activity Behaviors and Experiences of Grade 9 Students

Dr. Louise Humbert

Associate Professor

College of Kinesiology

University of Saskatchewan

Saskatoon, Saskatchewan
S7N 5C2

We would like to ask for your assistance with a study that is being carried out by the College of Kinesiology at the University of Saskatchewan. The purpose of this study is to investigate the impact of physical education program scheduling on the physical activity experiences and behaviors of grade 9 students. The findings from this project will provide valuable information to assist educators in developing future activity programs for youth.

If you decide to volunteer, your role will be to participate in an individual interview discussion regarding the scheduling of physical education in your school. This interview discussion will occur outside of school hours (e.g. lunch or after school) and is anticipated to take approximately 20-30 minutes. Participation is entirely voluntary; there will be no reward for participating and no negative consequences for non-participation.

The data collected will be kept anonymous and confidential. All the information provided through the interview will be confidential and stored by Dr. Louise Humbert in a locked office on the University Campus for a minimum of five years after the completion of the study. You may withdraw from the study at any time without question from the researcher.

With your permission, the information gained from this study will be used to determine factors affecting youth's maintenance of an active lifestyle related to the scheduling of physical education and the role that its scheduling may play. If you decide you would like to be a part of this study, please complete the attached form. If you have any questions or concerns about this study, please do not hesitate to contact Dr. Louise Humbert (306-966-1070) at any time.

Please Read and Sign Your Consent

I have read and understand the purpose of this study and my involvement in it. I am aware that I will remain anonymous throughout the study and in any written results of the data collection through participation in this project. I am aware that I have the right to refrain from answering any questions that I feel uncomfortable answering and that I have the right withdraw from the study at any time. I acknowledge that I have received a copy of the consent letter for my records. If I have any questions or concerns I can contact Dr. Louise Humbert (306-966-1070) in the College of Kinesiology at the University of Saskatchewan. If I wish to clarify my rights as a research participant, I may call the Ethics Office (306-966-2084) at the University of Saskatchewan.

I, _____ give my consent to participate in the study

conducted by the College of Kinesiology.

Signature _____ Date _____

APPENDIX C

Modified Activity Questionnaire (MAQ-A)

Do not fill out. Office use only.

ID #: _____

DATE:

_____
(Year/month/day)

IN MOTION PROJECT

How to Keep Youth Physically Active: The Effect of Physical Education Scheduling

School: _____

Grade: _____

Identification #: _____ **(Example: TCNov0884)**

(Initials, Month of birth, Day of birth, Year of birth)

Modifiable Activity Questionnaire for Adolescents

Date _____ **ID** ___ ___ ___ ___ □ Male

School _____ Class _____ □ Female

1. On a typical day, how do you get to school?
   - □ Walk
   - □ Bike
   - □ Bus
   - □ Car
   - □ Other, please specify:
     _____

2. Do you participate in intramural activities/open gym at your school?
   - □ Yes
   - □ No

3. (a) If yes, how many times in the last 14 days have you been involved in an intramural physical activity?
   - □ None
   - □ 1 to 2 days
   - □ 3 to 5 days
   - □ 6 to 8 days
   - □ 9 or more days

   (b) If no, why not? Please check all boxes that apply:
   - □ Did not have proper attire
   - □ Did not want to sweat and shower at lunch
   - □ Did not know what activity was being offered
   - □ Was not interested in the activity being offered
   - □ I had no one to go with
   - □ I did not feel that I had the skills to participate
   - □ I am involved in a school athletic team and did not want to workout twice in one day
   - □ Went out for lunch
   - □ I had other commitments (Student council, band, homework)
   - □ Other:
     _____
     _____

4. Are you currently a member of a school sports team?
   - □ Yes
   - □ No

   If yes, what team(s)?
   _____
   _____

5. Do you think physical education should be semestered (every day for one semester) or non-semestered (every second day for both semesters)?

   □ Semestered
   □ Non-semestered

   Why?

   _____
   _____
   _____
   _____

6. What do you like most about your physical education class?

   _____
   _____
   _____
   _____

7. What do you like the least about your physical education class?

   _____
   _____
   _____
   _____

8. Would you prefer semestered or non-semestered physical education next year in grade 10?

   □ Semestered
   □ Non-semestered

9. Do you see yourself enrolling in optional grade 11 and/or grade 12 physical education in future years?

   □ Yes
   □ No

   Why or why not?

   _____
   _____
   _____
   _____

Thank you for your time!

MY PHYSICAL ACTIVITY DURING THE PAST MONTH

A. Let's start with **Activities That You Sign Up Or Register For:** Examples of these kinds of activities may include playing on a school, community or zone team, taking dance or swimming lessons, or attending an exercise class.

1. Circle all of the activities that you participated that in the PAST MONTH that you had to sign up or register for. Do not include time spent in school physical education classes.

Aerobics	Curling	Kickboxing	Skiing Downhill	Taebo
Archery	Dance	Lacrosse	Skiing-Xcountry	Tennis
Badminton	Diving	Martial Arts	Soccer	Track
Baseball	Figure skating	Racquetball	Softball	Volleyball
Basketball	Football	Ringette	Speed Skating	Wrestling
Bowling	Gymnastics	Rowing	Street/Flr Hockey	Yoga
Boxing	Ice hockey	Rugby	Swimming	Other
			Syncro	_____

2. List **each** activity that you circled above in the "Activity" box below.
3. For **each** activity, record the number of times you participated **each** week for the last 4 weeks.
4. For **each** activity, estimate the average number of minutes that you spent participating **each** time. Record this in the last box. Only report the time that you were **actively participating in the activity**.
5. For each activity, record the intensity as **Light** (light change from normal breathing), **Medium** (above normal breathing), or **Heavy**.
6. For **each** activity, record where the activity takes place, at **School (S), Park (P), Facility (F)**

ACTIVITY	Number of Times Doing the Activity				Ave # of Minutes You Were Active in the Activity EACH Time	Intensity L=Light M=Medium H=Heavy	Location S= School P= Park F= Facility
	Last Week	Week 2	Week 3	Week 4			

B. Now we would like you to think of all the activities that you participated in the past month that **You *Did Not* Need To Sign Up Or Register For:** Examples of these kinds of activities may include walking, biking, jogging, skateboarding, swimming, or getting together with friends for a basketball game.

1.Circle all of the activities that you participated in the **PAST MONTH** that you **DID NOT** have to **Sign Up or Register For**. Do not include time spent in school physical education classes.

Aerobics	Dance-Break	Racquetball/Squash	Skipping	UltimateFrisbee
Badminton	Football	Ringette	Snowboarding	Volleyball
Baseball	Garden/Yard Work	Rowing	Soccer	Walking
Basketball	Golf	Rugby	Softball	Wall Climbing
Biking-Outdoors	Gymnastics	Running	Street/Floor hockey	Weight training
Biking-Stationary	Hacki sac	Shoveling	Swimming-Diving	Wrestling
Bowling	Hiking	Skateboarding	Swimming-Laps	Yoga
Boxing	Horseback Riding	Skating-Ice	Swim-Leisure	Other _____
Curling	Ice hockey	Skating-Inline	Taebo	
Dance	MartialArts/Kickbox	Skiing-Downhill	Tennis	
Dance-Aboriginal	Ping Pong	Skiing-X Country	Trampoline	

2. List **each** activity that you circled above in the "Activity" box below.
3. For **each** activity, record the number of times you participated **each** week for the last 4 weeks.
4. For **each** activity, estimate the average number of minutes that you spent participating **each** time. Only report the time that you were **actively participating in the activity**.
5. For each activity, record the intensity as **Light** (light change from normal breathing), **Medium** (above normal breathing), or **Heavy**.
6. For **each** activity, record where the activity takes place, at **Home (H), School (S), Park (P), Facility (F).**

ACTIVITY	**Number of Times Doing the Activity**				**Ave # of Minutes You Were Active in the Activity EACH Time**	**Intensity** L=Light M=Medium H=Heavy	**Location** S= School P= Park F= Facility
	Last Week	**Week 2**	**Week 3**	**Week 4**			

APPENDIX D

Interview Guide: Focus Groups

Guiding Questions for Student Focus Groups

Provide a brief explanation of the purpose for the interview – to explore their beliefs, attitudes and perceptions on the scheduling of physical education: its effects on their physical activity levels, likes/dislikes, and preference between the semestered and non-semestered physical education programs.

Explain that the purpose for tape recording is to help me be as accurate as I can with the words that they say and that if I were to write things down I might miss something. Stress how important their words are to me and that no one would be able to listen to the tape except for me. I will write everything out and go over it with them in person and if they choose at that time, they can keep the tape.

If they are reluctant to tape, let them know that we could start taping and if it really bothers them, then we can stop.

---

1. What do you like about physical education?
2. What do you dislike about physical education?
3. Last term you had physical education everyday, or; This year you have physical education every-other day,
   do you like having physical education everyday/every-other day?
4. Do you think that the different types of physical education schedules has an impact on your participation in physical activity. For example, do you think you were more active or less active during the semester you had physical education?
5. Do you think that the different types of scheduling physical education has an impact on the participation of your friends in intramurals, school sports teams, the selection of elective physical education, or their activity levels in general?
6. Would you change the scheduling of physical education if you could? In what way?
7. Which do you think that you would prefer if you were able to choose?
8. If you could change one or two things about physical education in your school what would it be?
9. What do you think that goal of physical education is at your school?
   From your experiences, do you think this goal is being adhered to?

APPENDIX E

Interview Guides: Key decision-makers

Physical Education Staff

High School Administration Members

Physical Education Consultants

Guiding Questions for Interview with Physical Education Staff

Provide a brief explanation of the purpose for the interview – to explore their beliefs, attitudes and perceptions on the scheduling of physical education: its effect on physical activity levels in grade 9 students, advantages/disadvantages, and preference between the semestered and non-semestered physical education programs.

Explain that the purpose for tape recording is to help me be as accurate as I can with the words that they say and that if I were to write things down I might miss something. Stress how important their words are to me and that no one would be able to listen to the tape except for me. I will write everything out and go over it with them in person and if they choose at that time, they can keep the tape.

If they are reluctant to tape, let them know that we could start taping and if it really bothers them, then we can stop.

To begin, I'd like to know a little bit about you:

a. What is your name?
b. How long have you been teaching?
c. What is your degree and where did you graduate from?
d. What is your previous teaching experience?

1. What is the goal of physical education at your school?
   How is this goal is being adhered to?
   Extension: If I was to observe your class, what would I see?
2. What has your experience been with semestered physical education?
   Extension: Have you always taught semestered physical education?
3. Do you think that there are any advantages to semestered physical education?
   Do you think that there are any advantages to non-semestered physical education?
4. As a teacher, what do you prefer?
5. Why do you think that physical education is scheduled this way at your school?
   Extension: Timetabling?
   Philosophy of the program?
   Promotes physical activity of the youth?
6. Do you think that the scheduling of physical education has an effect on:
   - Physical activity levels of the students?
   - Participation in intramural activities?
   - Participation in school sport teams?
   - The selection of elective physical education?
7. Would you change the scheduling of physical education if you could?
   In what way?
8. What do you think the students prefer? Why?

Guiding Questions for Interview with a Member of the School Administration Team

Provide a brief explanation of the purpose for the interview – to explore their beliefs, attitudes and perceptions on the scheduling of physical education: its effect on physical activity levels in grade 9 students, advantages/disadvantages, and reason for implementing the current schedule.

Explain that the purpose for tape recording is to help me be as accurate as I can with the words that they say and that if I were to write things down I might miss something. Stress how important their words are to me and that no one would be able to listen to the tape except for me. I will write everything out and go over it with them in person and if they choose at that time, they can keep the tape.

If they are reluctant to tape, let them know that we could start taping and if it really bothers them, then we can stop.

To begin, I'd like to know a little bit about you:

a. What is your name?
b. How long have you been an administrator?
c. How many years have you been at this school?

Intro: Grade 9 physical education at your school is scheduled as _____.

1. What is the goal of your school's physical education program?
   How is this goal is being adhered to?
   Extension: If I was to observe a physical education class in your school, what would I see?
2. Can you identify some successes of your physical education program?
   Can you identify some challenges that your physical education program faces?
3. Can you help me to understand why physical education is scheduled the way that it is at your school?
   Possible responses: *Timetabling*
   All other schools do it this way in the area
   Easier to coordinate transfer students
   PE staff wants it that way
   Other staff wants it that way
4. Do you think scheduling physical education this way has an effect on student participation in:
   - Intramurals?
   - School sport teams? Community-based activities?
   - The selection of elective physical education?
   - Activity levels in general?

Guiding Questions for Interview with Physical Education Consultant

Provide a brief explanation of the purpose for the interview – to explore their beliefs, attitudes and perceptions on the scheduling of physical education: the goal of the physical education program in their school division and success/challenges you have encountered, justification for the scheduling adopted by their specific division, advantages/disadvantages, and perceived effect of the scheduling on student activity levels.

Explain that the purpose for tape recording is to help me be as accurate as I can with the words that they say and that if I were to write things down I might miss something. Stress how important their words are to me and that no one would be able to listen to the tape except for me. I will write everything out and go over it with them in person and if they choose at that time, they can keep the tape.

If they are reluctant to tape, let them know that we could start taping and if it really bothers them, then we can stop.

To begin, I'd like to know a little bit about you:

a. What is your name?
b. How long have you been a physical education consultant?
c. What is your previous teaching experience?

1. What is the goal of physical education in your school division?
2. Can you identify some successes of your school divisions' physical education program?
   Can you identify some challenges that your physical education program faces?
3. Currently physical education at the grade 9 level in your school division is scheduled as a (non) semestered course. What are the reasons that it is scheduled this way?
   Is the scheduling of physical education ever discussed in meetings that you attend?
4. Do you see advantages to this schedule? Disadvantages?
5. Do you think that the scheduling of physical education has an effect on:
   a. Physical activity levels of the students?
   b. Participation in intramural activities?
   c. Participation in school sport teams?
   d. Participation in community-based activities?
   e. The selection of elective physical education?
6. What do you think the students prefer? Why?